



## Workshop Manual

Fox 2004 ➤ , Fox 2010 ➤ , Fox 2014 ➤ ,  
SpaceFox 2006 ➤ , SpaceFox 2011 ➤

5-speed manual gearbox (02T and 0AP)

Edition 02.2017



## List of Workshop Manual Repair Groups

### Repair Group

- 00 - Technical data
- 30 - Clutch
- 34 - Controls, housing
- 35 - Gears, shafts
- 39 - Final drive - differential



Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.



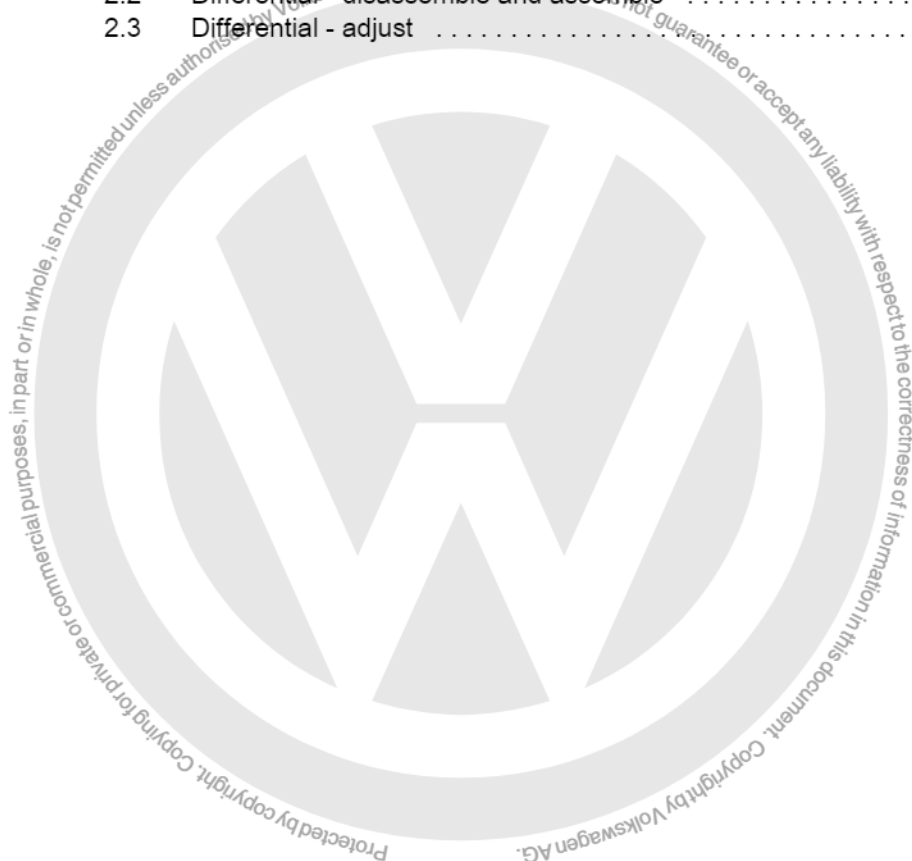


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## 00 – Technical data

### 1 Identification

(VRL010074; Edition 02.2017)

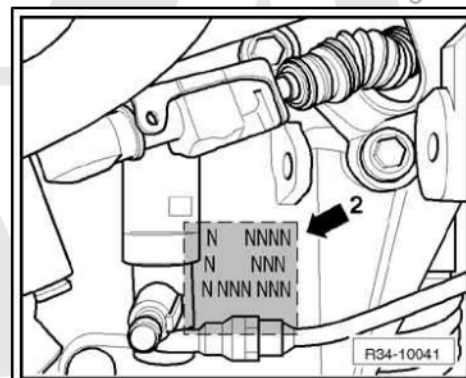
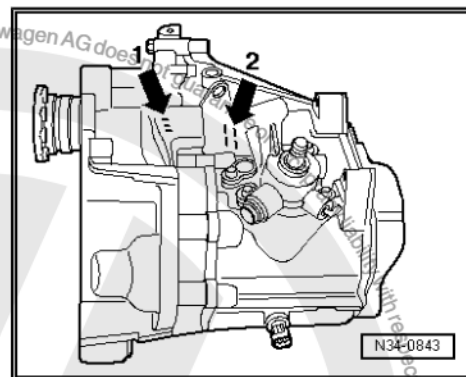
⇒ ["1.1 Identification on the gearbox", page 1](#)

⇒ ["1.2 Prefix, Assignment, gear ratio, filling volume", page 2](#)

#### 1.1 Identification on the gearbox

Prefixes (identification letters) and manufacturing date -arrow 1-

5-speed manual gearbox (02T, 0AP) -arrow 2-, located under the clutch's hydraulic slave cylinder.



Gearbox prefix and manufacturing date.

Example:

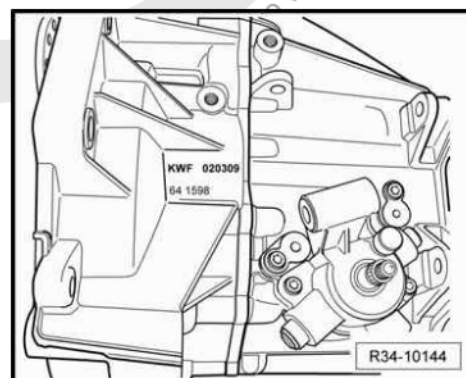
Example:	KWF	02	03	09
	Prefix	Day	Month	Production year
				2009

Supplementary data depend on the manufacturing



Note

- ◆ Eventual existing additional data are related to the manufacturing process.
- ◆ Transmission prefixes are also included on the vehicle identification plate.





## 1.2 Prefix, Assignment, gear ratio, filling volume

⇒ "1.2.1 Gearboxes installed together with engines (AQZ, BAH, BJA, BJE, BKR, BLH, BMD, BNX, BRA, CCNA, CCRA, CFZA, CHFA, CHFB, CPBA)", page 2

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### 1.2.1 Gearboxes installed together with engines (AQZ, BAH, BJA, BJE, BKR, BLH, BMD, BNX, BPA, CCNA, CCRA, CFZA, CHFA, CHFB, CPBA)

Manual gearbox		5-speed 02T and 0AP		
Identification letters (prefix)		EJY	GXS	
Manufacturing	from	08.03	10.03	11.05
	to	11.03	07.07	07.07
Assignment	Model	Fox 2004 ►	Fox 2004 ►	SpaceFox 2006 ►
	Engine	1.0 l - 53 kW	1.6 l - 74 kW	1.6 l - 74 kW
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	69 : 14 = 4.929	68 : 15 = 4,533	68 : 15 = 4,533
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)

Manual gearbox		5-speed 02T and 0AP		
Identification letters (prefix)		GZK	HCS	HFG
Manufacturing	from	12.04	01.05	11.03
	to	03.07	01.07	05.07
Assignment	Model	Fox 2005 ►	Fox 2005 ►	Fox 2004 ►
	Engine	1.4 l - 55 kW	1.4 l - 51 kW	1.0 l - 52 kW
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	67 : 16 = 4.188	65 : 18 = 3.611	69 : 14 = 4.929
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)

Manual gearbox		02T 5-speed		
Identification letters (prefix)		HSG	HUY	HZM
Manufacturing	from	02.05	12.04	03.07
	to	07.07	03.07	08.07



Manual gearbox		02T 5-speed		
Identification letters (prefix)		HSG	HUY	HZM
Assignment	Model	Fox 2005 ►	Fox 2005 ►	Fox 2007 ►
	Engine	1.6 l - 74 kW	1.2 l - 40 kW	1.2 l - 40 kW
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	68 : 15 = 4.533	68 : 15 = 4.534	67 : 16 = 4.187
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)

Manual gearbox		02T 5-speed		
Identification letters (prefix)		JGH	JHJ	JHK
Manufacturing	from	03.07	03.07	01.07
	to	12.09	11.09	02.10
Assignment	Model	Fox 2007 ►	Fox 2007 ►	Fox 2007 ►
	Engine	1.4 l - 55 kW	1.4 l - 55 kW	1.6 l - 74 kW
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	67 : 16 = 4.187	67 : 16 = 4.187	68 : 15 = 4.533
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)

Manual gearbox		5-speed 02T and 0AP		
Identification letters (prefix)		JHN	JJZ	
Manufacturing	from	01.07	01.07	01.07
	to	07.11	11.10	
Assignment	Model	Fox 2007 ►	Fox 2007 ►	SpaceFox 2007 ►
	Engine	1.2 l - 40 kW	1.6 l - 74 kW	1.6 l - 74 kW
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	67 : 16 = 4.187	68 : 15 = 4.533	68 : 15 = 4.533
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)



Manual gearbox		5-speed 02T and 0AP		
Identification letters (prefix)		JKE	JPU	JUR
Manufacturing	from	03.07	07.06	01.07
	to	12.09	08.07	07.11
Assignment	Model	Fox 2007 ►	Fox 2007 ►	Fox 2007 ►
	Engine	1.0 l - 52 kW	1.2 l - 40 kW	1.2 l - 40 kW
gearbox ratio Z <sub>2</sub> :	Differential	69 : 14 = 4.928	67 : 16 = 4.187	67 : 16 = 4.187
Z <sub>1</sub> :				
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)

Manual gearbox		5-speed 02T and 0AP		
Identification letters (prefix)		KWF		KWG
Manufacturing	from	03.08	02.07	03.08
	to	02.10	07.11	11.09
Assignment	Model	Fox 2008 ►	SpaceFox 2007 ►	Fox 2007 ►
	Engine	1.6 l - 74 kW	1.6 l - 74 kW	1.0 l - 54 kW
gearbox ratio Z <sub>2</sub> :	Differential	67 : 16 = 4.187	67 : 16 = 4.187	69 : 14 = 4.928
Z <sub>1</sub> :				
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)

Manual gearbox		5-speed 02T and 0AP		
Identification letters (prefix)		KWJ	LNC	
Manufacturing	from	03.08	11.08	04.09
	to	02.10	02.10	11.09
Assignment	Model	Fox 2008 ►	Fox 2009 ►	SpaceFox 2009 ►
	Engine	1.6 l - 74 kW	1.6 l - 74 kW	1.6 l - 74 kW
gearbox ratio Z <sub>2</sub> :	Differential	68 : 15 = 4.533	67 : 16 = 4.187	67 : 16 = 4.187
Z <sub>1</sub> :				
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)



Manual gearbox		02T 5-speed		
Identification letters (prefix)		LUH	LUZ	LVC
Manufacturing	from	11.09	11.09	09.10
	to	09.10	09.10	07.11
Assignment	Model	Fox 2010 ►	Fox 2010 ►	Fox 2011 ►
	Engine	1.4 l - 55 kW	1.4 l - 55 kW	1.2 l - 40 kW
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	67 : 16 = 4.187	67 : 16 = 4.187	67 : 16 = 4.187
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)

Manual gearbox		5-speed 02T and 0AP		
Identification letters (prefix)		LVL	LVL	LVW
Manufacturing	from	11.09	11.09	11.09
	to	10.13	12.13	10.13
Assignment	Model	Fox 2010 ►	SpaceFox 2010 ►	Fox 2010 ►
	Engine	1.6 l - 74 kW	1.6 l - 74 kW	1.6 l - 74 kW
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	67 : 16 = 4.187	67 : 16 = 4.187	67 : 16 = 4.187
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)

Manual gearbox		5-speed 02T and 0AP		
Identification letters (prefix)		LVW	LVX	LVZ
Manufacturing	from	11.09	11.09	11.09
	to	12.13	09.13	10.13
Assignment	Model	SpaceFox 2010 ►	Fox 2010 ►	Fox 2010 ►
	Engine	1.6 l - 74 kW	1.0 l - 54 kW	1.6 l - 74 kW
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	67 : 16 = 4.187	69 : 14 = 4.928	68 : 15 = 4.533
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch



◆ Gearbox oil (filling)

Manual gearbox		5-speed 02T and 0AP		
Identification letters (prefix)		LYL	MSK	NPW
Manufacturing	from	04.12	04.10	07.12
	to	03.13	10.13	09.13
Assignment	Model	Fox 2013 ►	Fox 2010 ►	Fox 2013 ►
	Engine	1.6 l - 74 kW	1.6 l - 74 kW	1.0 l - 56 kW
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	68 : 15 = 4.533	68 : 15 = 4.533	69 : 14 = 4.929
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)

Manual gearbox		5-speed 02T and 0AP		
Identification letters (prefix)		QEC	QED	QEE
Manufacturing	from	09.13	09.13	09.13
	to			
Assignment	Model	Fox 2014 ►	Fox 2014 ►	Fox 2014 ►
	Engine	1.0 l - 56 kW	1.6 l - 74 kW	1.6 l - 74 kW
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	69 : 14 = 4.929	67 : 16 = 4.188	68 : 15 = 4.533
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)

Manual gearbox		02T 5-speed		
Identification letters (prefix)		QEH	QEJ	QEK
Manufacturing	from	09.13	09.13	09.13
	to			
Assignment	Model	Fox 2014 ►	Fox 2014 ►	Fox 2014 ►
	Engine	1.0 l - 56 kW	1.6 l - 74 kW	1.6 l - 74 kW
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	69 : 14 = 4.929	67 : 16 = 4.188	68 : 15 = 4.533
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios





- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)

### 1.2.2 Gearbox installed together with engines (ASY, BNM)

Manual gearbox		02T 5-speed		
Identification letters (prefix)		HCS	JHG	KRJ
Manufacturing	from	01.05	01.07	09.07
	to	01.07	01.10	04.10
Assignment	Model	Fox 2005 ►	Fox 2007 ►	SpaceFox 2008 ►
	Engine	1.4 l - 51 kW	1.4 l - 51 kW	1.9 l - 47 kW
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	65 : 18 = 3.611	65 : 18 = 3.611	66 : 17 = 3.882
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)

Manual gearbox		02T 5-speed		
Identification letters (prefix)		KRJ	LUX	LUL
Manufacturing	from	12.07	11.09	04.10
	to	12.09	09.10	
Assignment	Model	Fox 2008 ►	Fox 2010 ►	SpaceFox 2010 ►
	Engine	1.9 l - 47 kW	1.4 l - 51 kW	1.9 l - 47 kW
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	66 : 17 = 3.882	65 : 18 = 3.611	66 : 17 = 3.882
Filling capacity		2.0 + 0.1 litres	2.0 + 0.1 litres	2.0 + 0.1 litres

The following information can be found in: ⇒ Electronic Parts Catalog "ETKA"

- ◆ Individual gear ratios
- ◆ Specification of the clutch
- ◆ Gearbox oil (filling)

### 1.2.3 Gearbox installed together with engines (CSEA)

Manual gearbox		02T 5-speed		
Identification letters (prefix)		PEL		
Manufacturing	from	04.13		
	to			
Assignment	Model	Fox 2014 ►		
	Engine	1.0 l - 59 kW		
gearbox ratio Z <sub>2</sub> : Z <sub>1</sub> :	Differential	69 : 14 = 4.929		



Manual gearbox	02T 5-speed		
Identification letters (prefix)	PEL		
Filling capacity	2.1 + 0.1 litres		

The following information can be found in: ⇒ Electronic Parts Catalogue "ETKA" .

- ◆ Individual gear ratios;
- ◆ Specification of the clutch;
- ◆ Gearbox oil (filling)





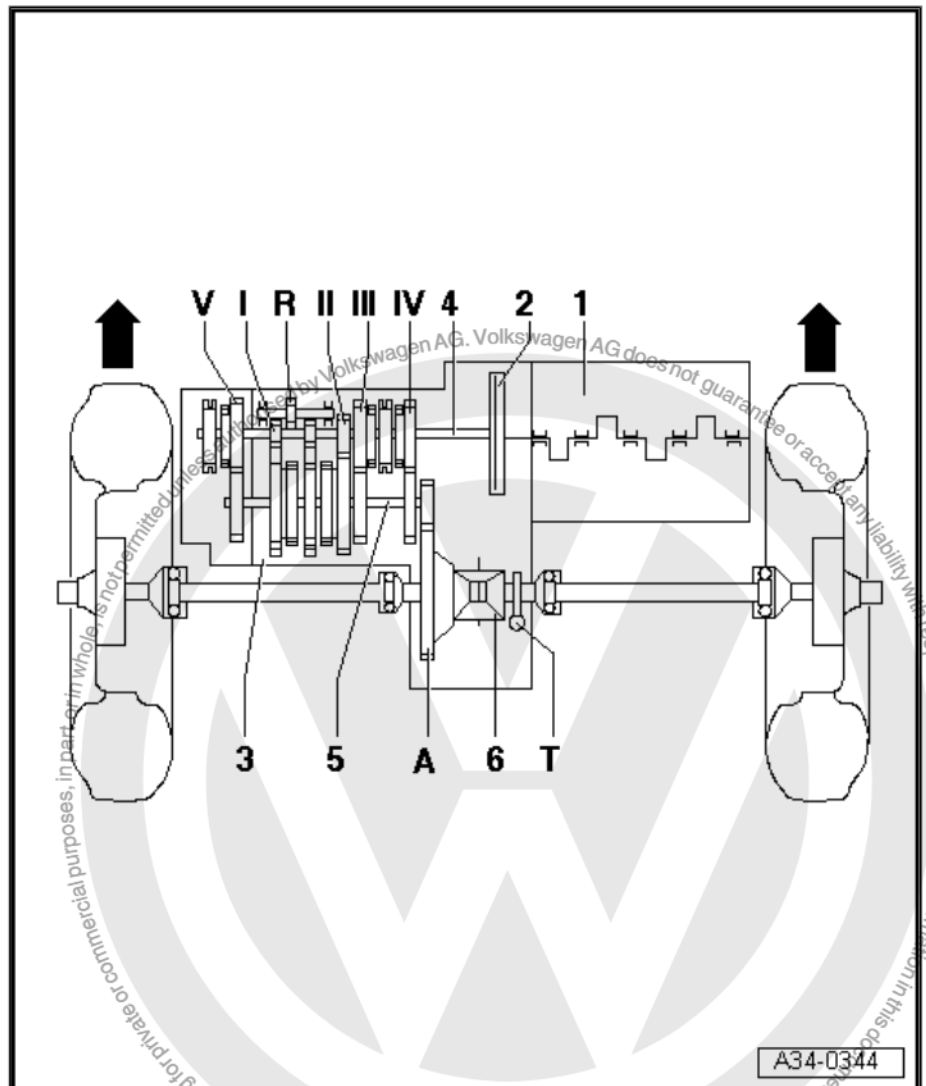
## 2 Transmission assembly scheme

⇒ "2.1 Nomenclature", page 9

⇒ "2.2 Gear ratios", page 10

### 2.1 Nomenclature

- 1 - Engine
- 2 - Clutch
- 3 - Mechanical gearbox
- 4 - Input shaft/driving shaft
- 5 - Output shaft/planet pinion
- 6 - Differential



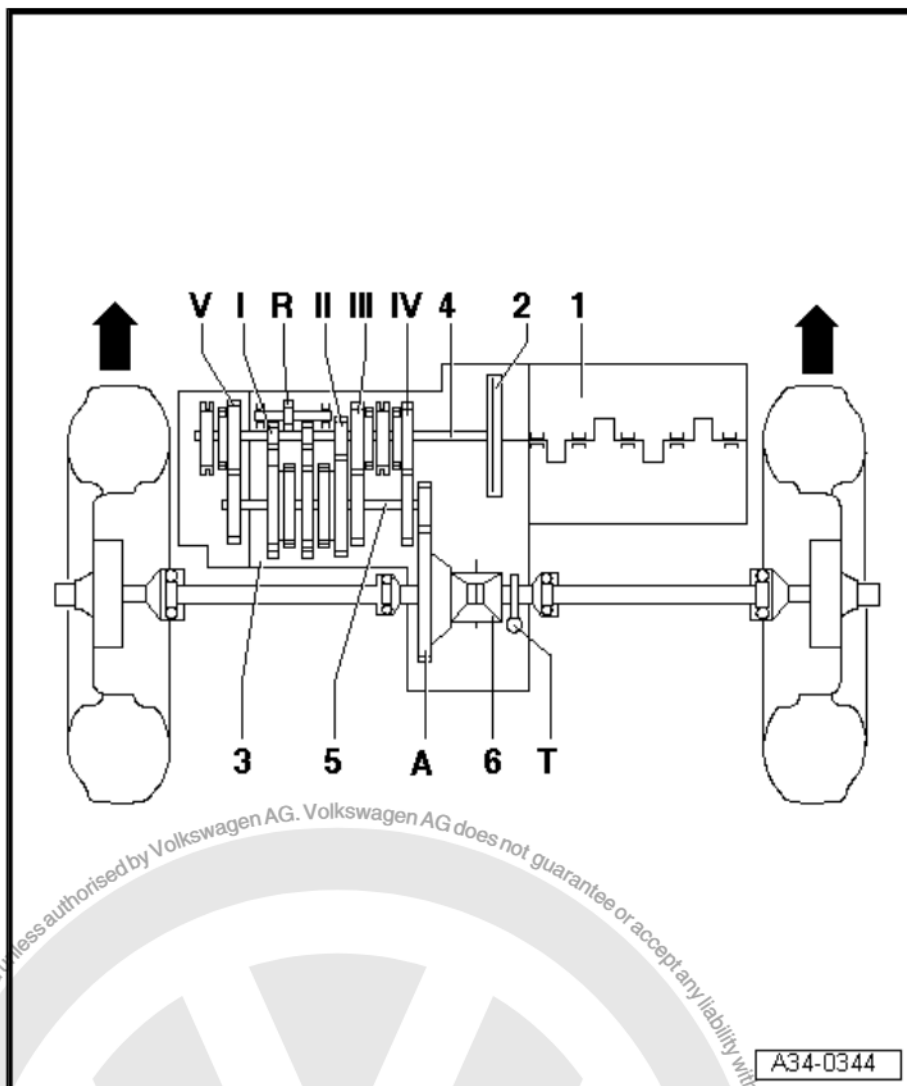
Note

Arrows indicate run direction.



## 2.2 Gear ratios

- I - 1st gear
- II - 2nd gear
- III - 3rd gear
- IV - 4th gear
- V - 5th gear
- R - Reverse gear
- A - Sprocket
- T - Speedometer control



### Note

Arrows indicate run direction.



### 3 Gearbox ratio "i"

⇒ "3.1 Gearbox ratio i - calculation", page 11

#### 3.1 Gearbox ratio "i" - calculation

Example:

	5th gear	Sprocket
driving gear	$ZG_1 = 50$	$ZA_1 = 18$
driven gear	$ZG_2 = 37$	$ZA_2 = 65$

$$i = Z_2 : Z_1$$

$$i_G = \text{gear gearbox ratio} = ZG_2 : ZG_1 = 37 : 50 = 0.740$$

$$i_A = \text{differential gear ratio} = ZA_2 : ZA_1 = 65 : 18 = 3.611$$

$$i_{\text{total}} = \text{Total gear ratio} = i_G \times i_A = 0.740 \times 3.611 = 2.672$$

1)  $Z_1$  = Number of teeth on the driving gear  $Z_2$  = Number of teeth on the driven gear





## 4 General repair instructions

⇒ ["4.1 Gearbox", page 12](#)

⇒ ["4.2 Gaskets and retainers", page 12](#)

⇒ ["4.3 Screws, nuts", page 13](#)

⇒ ["4.4 Roller bearings", page 13](#)

⇒ ["4.5 Adjustment shims", page 14](#)

⇒ ["4.6 Synchronizer rings", page 14](#)

### 4.1 Gearbox



#### WARNING

*For achieving a correct and successful repair of the transmission, maximum strictness and cleanliness, as well as accessible tools in good conditions, are essential conditions. Obviously, all the normal basic safety rules also apply in repairs.*

*We put together here a series of indications applicable to several operations, which are usually dispersed along the Repair Manual. These indications apply to this Repair Manual.*

- ◆ *First, clean the union points and adjacent regions before separating them.*
- ◆ *Put the disassembled parts on a clean base and cover them to prevent dirt. Use transparent film and paper. Do not use cloths that fray!*
- ◆ *Assemble clean parts only: Remove parts from the packaging only immediately before their assembly.*
- ◆ *Carefully cover or close open components, in case repair is not carried out immediately.*

- ◆ When assembling the transmission, pay attention on the correct seating of guide pins between engine and transmission.
- ◆ Whenever the transmission is replaced, fill with oil until the lower edge of the filling hole.
- ◆ Filling capacity and specification ⇒ [page 2](#)

### 4.2 Gaskets and retainers

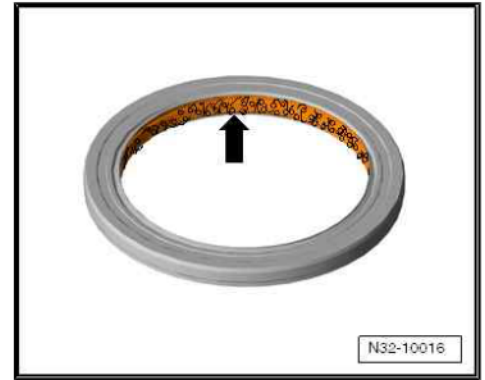


#### WARNING

- ◆ *When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00*
- ◆ *Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"*



- ◆ Always change O-rings, retainers and gaskets.
- ◆ After removing the gaskets, check whether the stop surface has burrs or damage resulting from the assembly.
- ◆ Before installing the retainers, lubricate slightly the outer diameter and fill the gap between the sealing lips -arrow- with Grease - G 052 128 A1- up to half height.



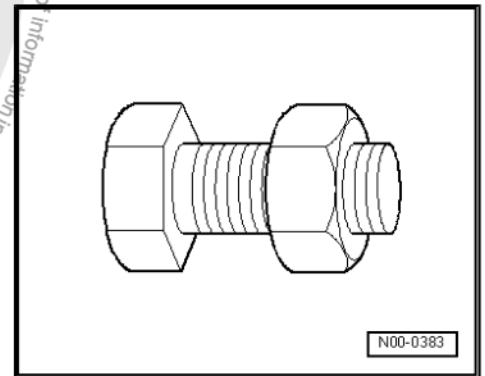
#### 4.3 Screws, nuts



##### WARNING

- ◆ *When handling chemicals follow the safety instructions ➔ Chemical Products Manual; Rep. gr. 00*
- ◆ *Assignment of Chemical Materials ➔ Electronic Parts Catalogue "ETKA"*

- ◆ Loosen and tighten cover and case fastening screws or nuts in a cross and phased pattern.
- ◆ The tightening torques indicated apply to non-oiled screws and nuts.
- ◆ The screw threads with locking paste must be cleaned with wire brush. Install screws with Locking paste - AMV 185 100 A1-
- ◆ All the self-locking screw holes must be cleaned from locking paste residues with screw tap. Otherwise, there is the risk of breaking the screws when they are removed again.



##### WARNING

*Always replace self-locking screws/nuts subject to angular torque.*

#### 4.4 Roller bearings

- ◆ Lubricate all the gearbox roller bearings with gear oil before installing them
- ◆ Needle bearings must fit into the labelled part (highest thickness of the plate), towards the fitting tool.
- ◆ The tapered roller bearings installed in a same shaft must be replaced as a set. If possible, they must be supplied by the same manufacturer.
- ◆ To install, heat inner rings up to approximately 100 °C
- ◆ Do not change outside and inner rings on a roller bearing by the rings from another roller bearing with the same size. Roller bearings are installed in pairs.

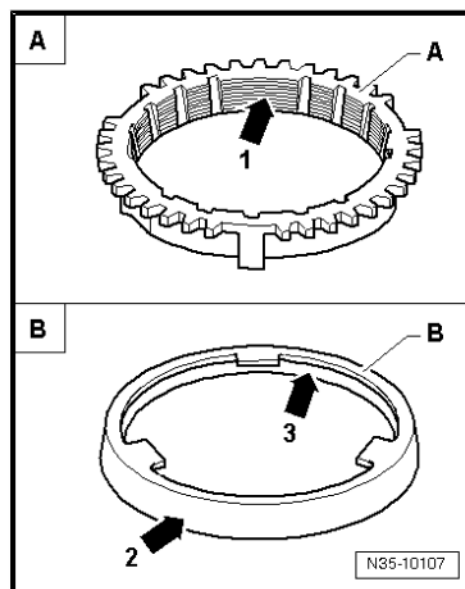


## 4.5 Adjustment shims

- ◆ Check the shim thicknesses in several places with micrometer. The existence of different tolerances enables calibrating the required shim thickness with accuracy.
- ◆ Check for burrs and damages.
- ◆ Only install adjustment shims in perfect conditions.

## 4.6 Synchronizer rings

- ◆ They should not be inverted. When reusing synchronizer rings, always install them on the same gear pair.
- ◆ Check for wear, and change them, if required.
- ◆ Lubricate with gear oil before installing.
- ◆ Check the splines -arrows- of the synchronizer ring -A- and the inner track for smooth areas (splines with wear).
- ◆ In the case of lines synchronizer rings, the lining must not be damaged.
- ◆ In an intermediate track -B- is installed, examine it at the outer friction areas -arrow 2- and inner friction areas -arrow 3-, for »splines«, »wear signs« and »blue colouring (due to overheating)«
- ◆ Check the selector gear cone for »splines« and »signs of wear«.
- ◆ Install the synchronizer rings with gear oil.







## 30 – Clutch

### 1 Command system

⇒ [“1.1 Control mechanism - \(version 1\)”, page 15](#)

⇒ [“1.2 Control mechanism - \(version 2\)”, page 28](#)

#### 1.1 Control mechanism - (version 1)

⇒ [“1.1.1 Command system \(version 1\) - component overview”, page 15](#)

⇒ [“1.1.2 Command pedals - assembly overview”, page 16](#)

⇒ [“1.1.3 Clutch pedal switch F36 with rectangular case - remove and install”, page 18](#)

⇒ [“1.1.4 Clutch pedal switch F36 with round case - remove and install”, page 19](#)

⇒ [“1.1.5 Clutch pedal return spring - remove and install”, page 20](#)

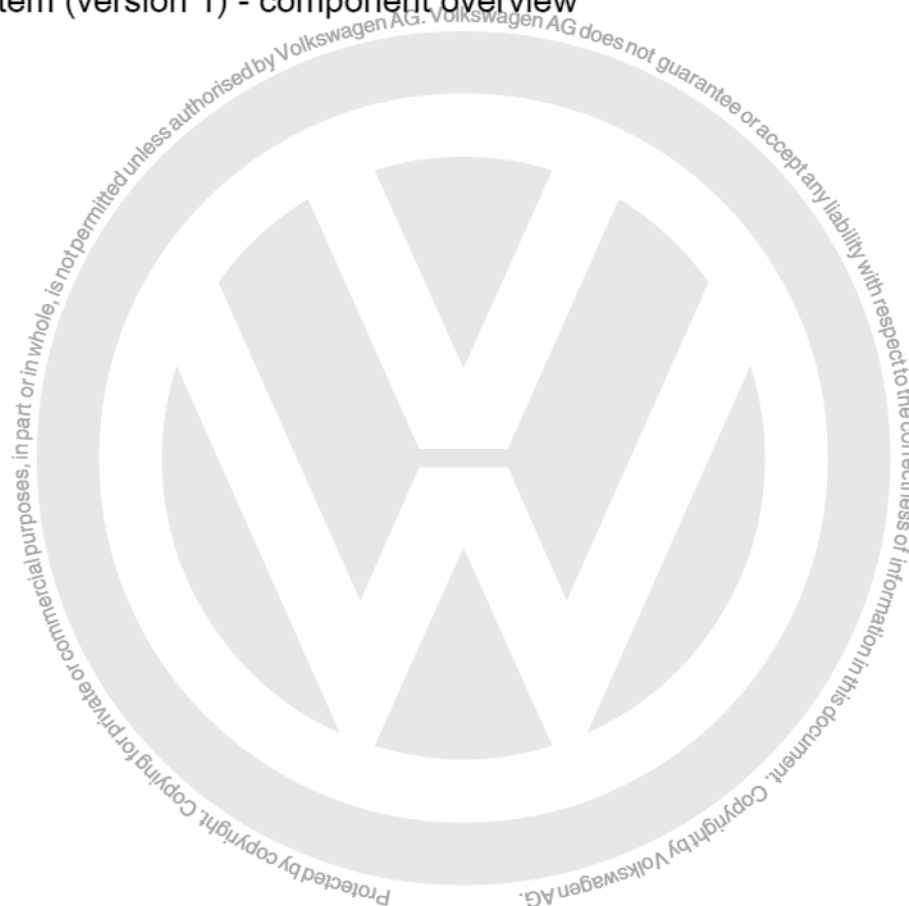
⇒ [“1.1.6 Clutch pedal support - remove and install”, page 21](#)

⇒ [“1.1.7 Clutch pedal - remove install”, page 23](#)

⇒ [“1.1.8 Hydraulic system - assembly overview”, page 24](#)

⇒ [“1.1.9 Transmitting cylinder - clutch hydraulic drive - remove and install”, page 26](#)

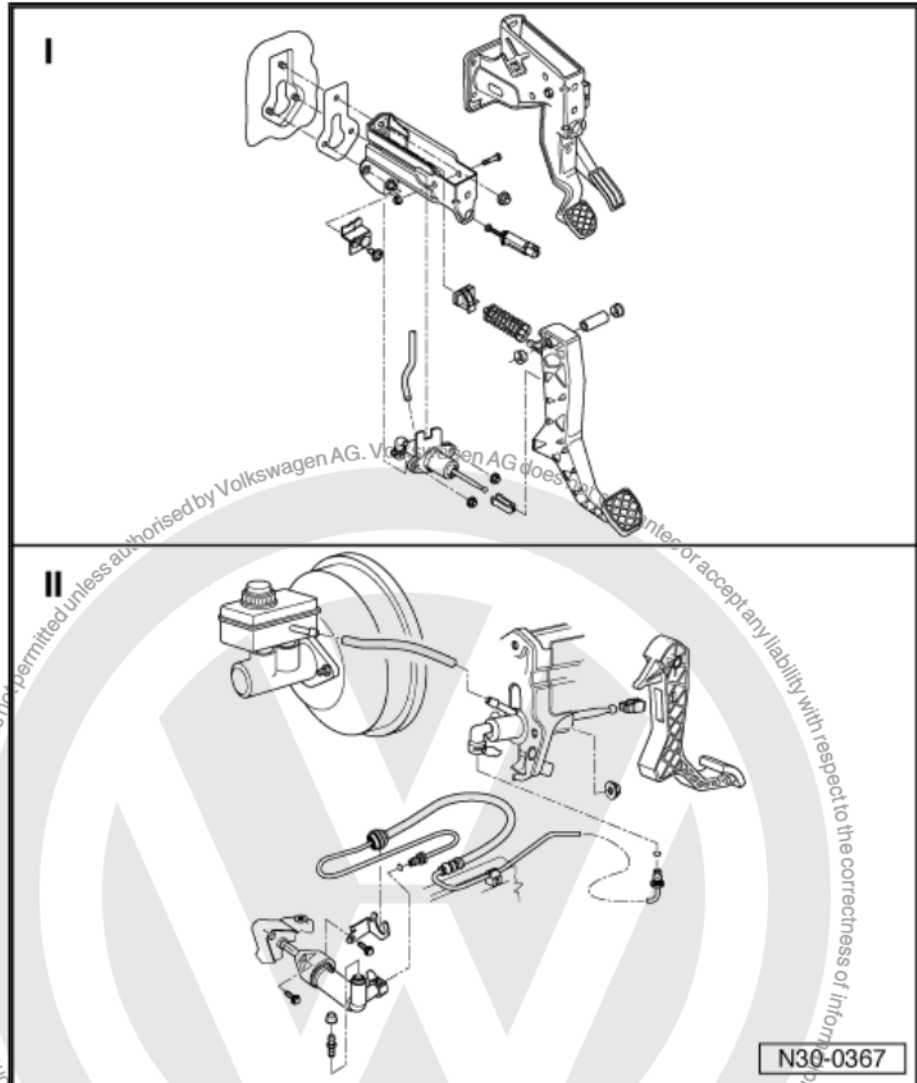
#### 1.1.1 Command system (version 1) - component overview





I - Command pedals - assembly overview ➔ [page 16](#)

II - Hydraulic system - assembly overview ➔ [page 24](#)



### 1.1.2 Command pedals - assembly overview



#### WARNING

*Self-locking screws/nuts must be replaced whenever loosened and/or removed.*



1 - Engine compartment's partition panel

- ☐ With housing for the clutch support and master cylinder

2 - Gasket

- ☐ Replace after every removal

3 - Pedal support

- ☐ For the clutch pedal housing
- ☐ Remove and install  
⇒ [page 21](#)

4 - Bolt

5 - Pedal support

- ☐ For the accelerator and brake pedal housing

6 - Hexagonal nut

- ☐ Self-locking
- ☐ 25 Nm
- ☐ Replace after every removal

7 - Clutch pedal switch - F36-

- ☐ There are two types  
⇒ [page 18](#)

8 - Pedal return spring

- ☐ Remove and install  
⇒ [page 20](#)

9 - Bearing bush

10 - Support pin

11 - Clutch pedal

- ☐ Remove and install ⇒ [page 23](#)

12 - Housing

- ☐ Remove and install ⇒ [Item 5 \(page 25\)](#)

13 - Hexagonal nut

- ☐ Self-locking
- ☐ 25 Nm
- ☐ Replace after every removal

14 - Clutch hydraulic drive transmitting cylinder

- ☐ Remove and install ⇒ [page 21](#)

15 - Lock

16 - Supply hose

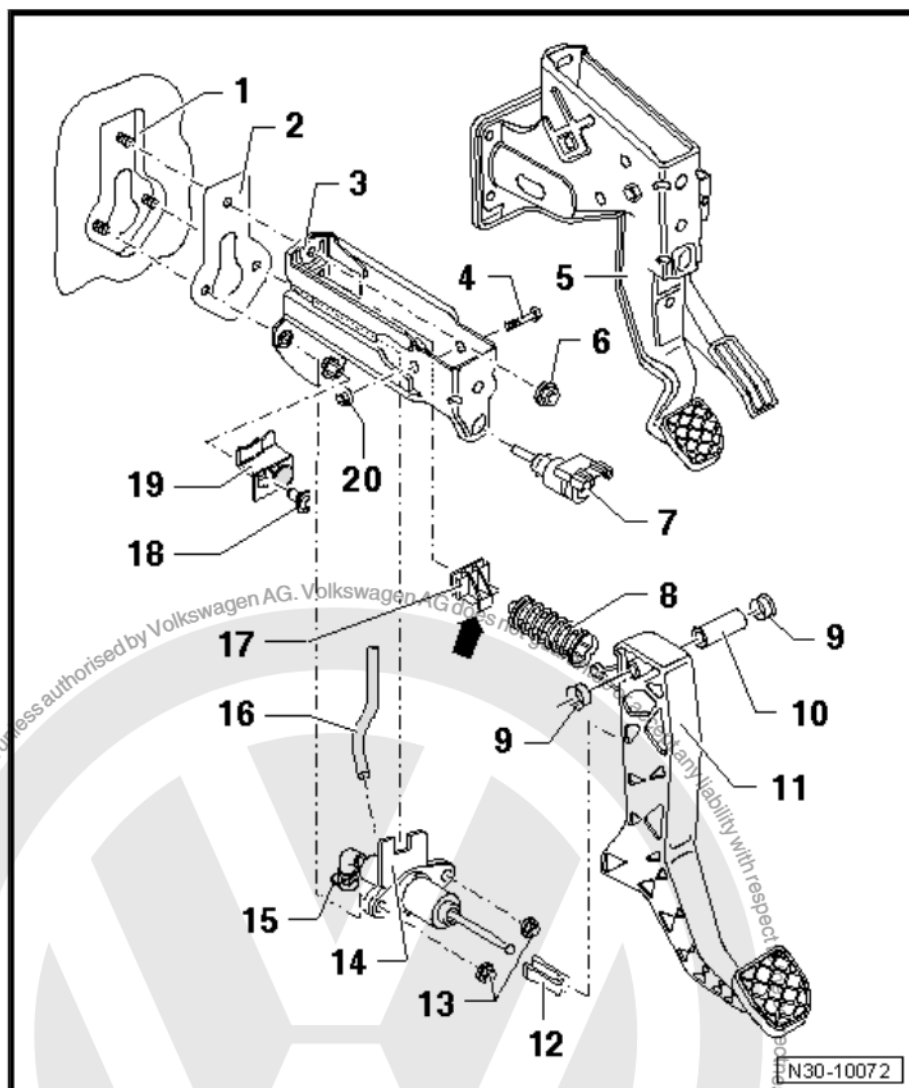
17 - Clutch pedal return spring housing

- ☐ Installation position: the tab -arrow- fits in the transmitting cylinder notch
- ☐ Install on the housing support
- ☐ To replace, remove and install the transmitting cylinder of the clutch hydraulic drive ⇒ [page 40](#)

18 - Bolt

19 - Limiter stop

- ☐ For clutch pedal





## 20 - Hexagonal nut

- ☐ Self-locking
- ☐ 25 Nm
- ☐ Replace after every removal

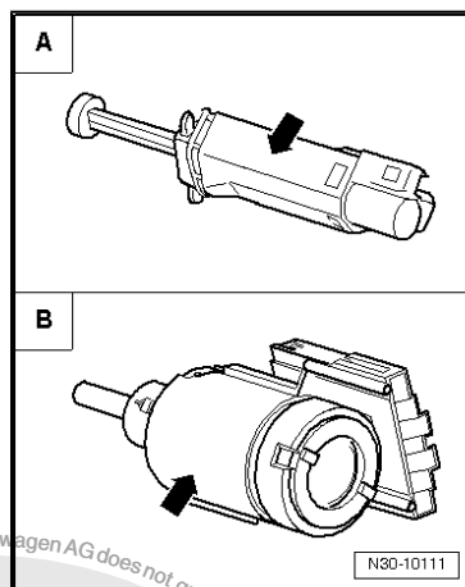
### Types of Clutch pedal switch - F36-

A - Clutch pedal switch - F36- with rectangular case -arrow-.

- Remove and install ⇒ [page 18](#) .

B - Clutch pedal switch - F36- with round case -arrow-.

- Remove and install ⇒ [page 19](#) .



### 1.1.3 Clutch pedal switch - F36- with rectangular case - remove and install



#### WARNING

- ◆ When handling chemicals follow the safety instructions ⇒ *Chemical Products Manual; Rep. gr. 00*
- ◆ Assignment of Chemical Materials ⇒ *Electronic Parts Catalogue "ETKA"*

To ensure a seating sufficiently firm on the support, the Clutch pedal switch - F36- must be mounted only once.

#### Removal:

- Disconnect connector from Clutch pedal switch - F36- .
- Turn the Clutch pedal switch - F36- 90° clockwise and remove it from support.

#### Installation:

- Pull rod "pivot" to the stop.
- Press clutch pedal towards the partition panel in the engine compartment.

Before installing the Clutch pedal switch - F36- on the support, a small amount of Polyurea grease - G 052 142 A2- must be applied on the "pivot" rod of the clutch switch

- Install the clutch pedal switch - F36- of the clutch on the support and fasten it by turning it 90° anticlockwise.
- Engage the connector of the Clutch pedal switch - F36- connector.



### 1.1.4 Clutch pedal switch - F36- with round case - remove and install



#### WARNING

*The Clutch pedal switch - F36- must only be removed from the pedal support with the rod pressed downwards, otherwise the switch housing will be damaged.*

- ◆ When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00
- ◆ Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"

#### Removal:

- Disengage the connector -1- from the Clutch pedal switch - F36- .
- Press the rod-3- of the Clutch pedal switch - F36- .
- Turn the Clutch pedal switch - F36- -2- 45° in counterclockwise direction and remove it through the support hole.



#### Note

*The clutch pedal remains in the rest position (not activated).*

#### Installation:

- Apply the polyurea grease - G 052 142 A2- on the rod, zone -A-.

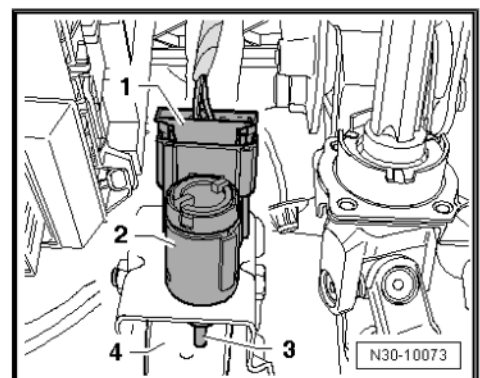
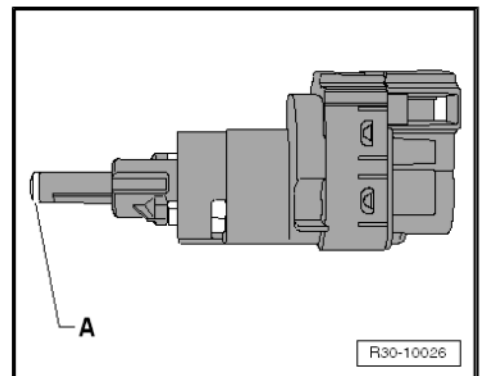
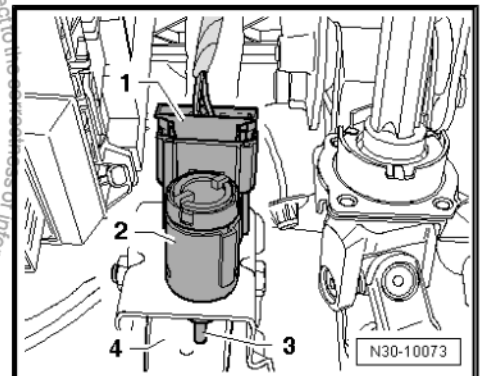
- Install the Clutch pedal switch - F36- -3- in its respective housing, by pressing the activation rod -3- and fastening it by turning it (45°) clockwise.



#### Note

*The clutch pedal remains in the rest position (not activated).*

- Connect the connector -1- of the Clutch pedal switch - F36- .
- After installation, check that it works properly. For some vehicles, depending on the engine, its working order can be checked by means of ⇒ Vehicle diagnostic tester.

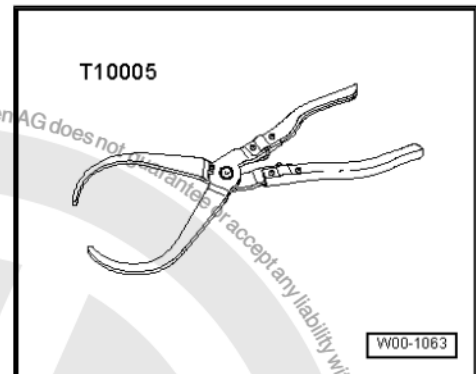




### 1.1.5 Clutch pedal return spring - remove and install

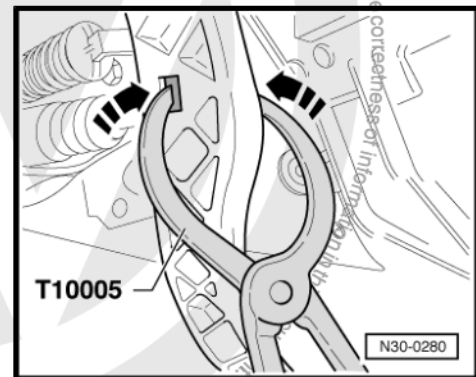
Special tools and workshop equipment required

- ◆ Pliers - T 10005-



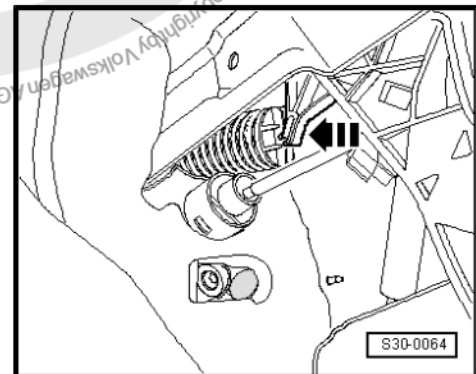
Removal:

- Remove the Clutch pedal switch - F36- ➔ [page 18](#)
- Pull clutch pedal slightly towards front seat and press inwards both sides of the housing with Pliers - T 10005- both sides of the housing inwards -arrows-.
- Separate the transmitting cylinder stem from the clutch pedal's hydraulic drive.



- Press the return spring towards the partition panel -arrow- and remove it from downwards.

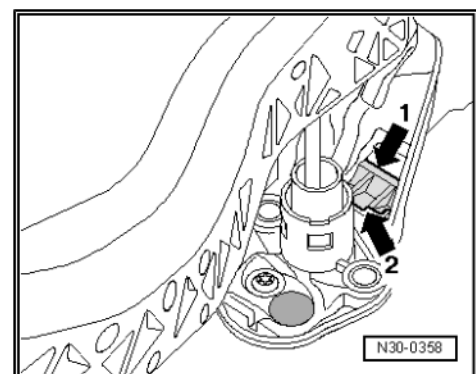
Installation:



- Check that the support -arrow 1- for the pedal return spring is installed on the support.

Installation position:

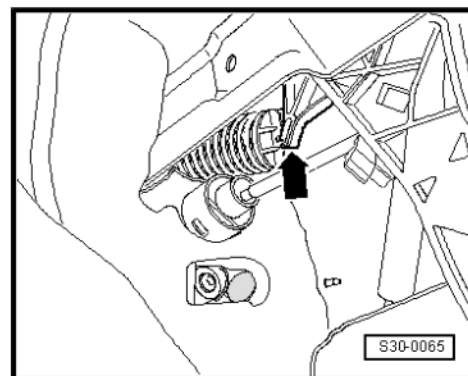
- The support tab should be into the gear cylinder notch -arrow 2-.





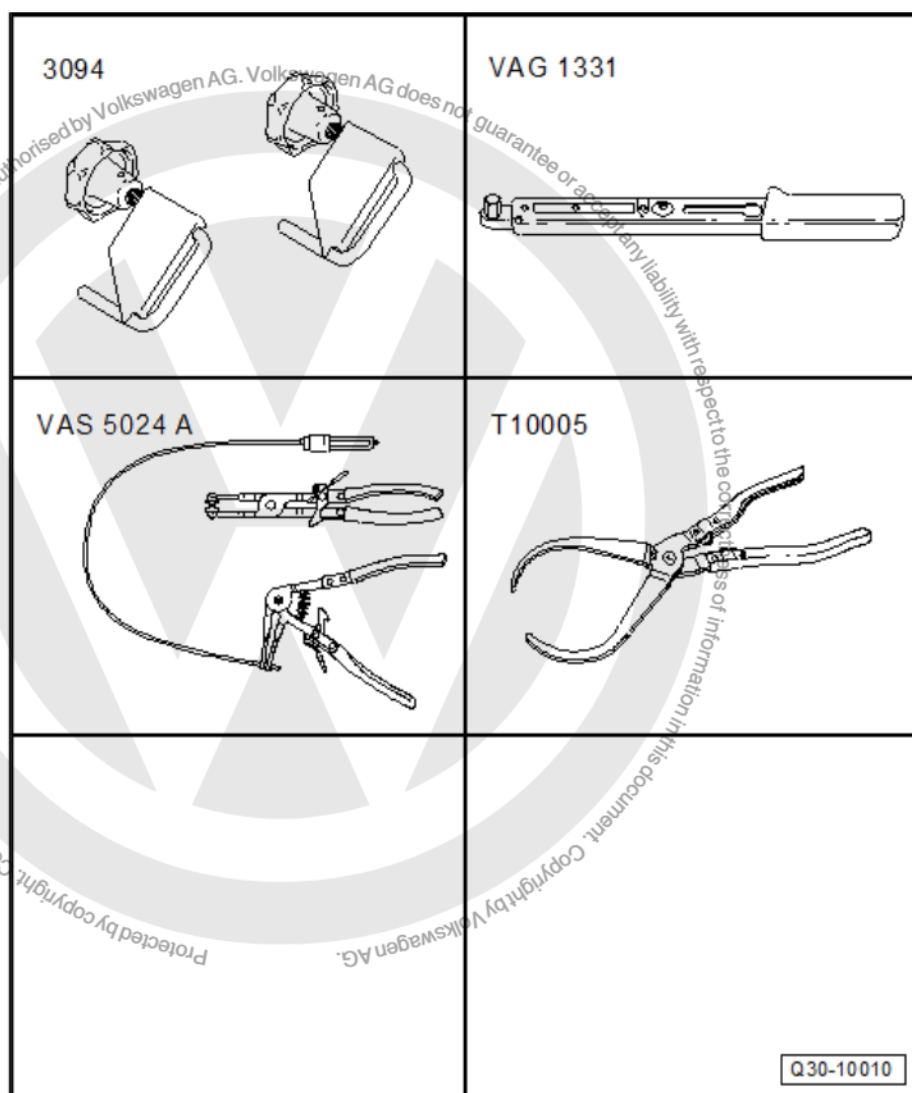


- First, install the pedal return spring on the rear part of the support.
- Then, press the pedal return spring on the support tab -arrow-.
- Install the Clutch pedal switch - F36- ➔ [page 18](#)



### 1.1.6 Clutch pedal support - remove and install

Special tools and workshop equipment required



- ◆ Clamps (diameter 25 mm) - 3094-
- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-
- ◆ VW 5162 or Standard type clamp pliers - VAS 5024A-
- ◆ Pliers - T 10005-



#### Removal:

- Disconnect the Battery - A- ⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .
- Pull the harness carefully forwards.
- Place a lint-free cloth sufficiently large under the transmitting cylinder of the clutch hydraulic drive.
- Install Clamp (diam.25 mm) - 3094- on the return hose -A- and release it from the transmitting cylinder.



#### Note

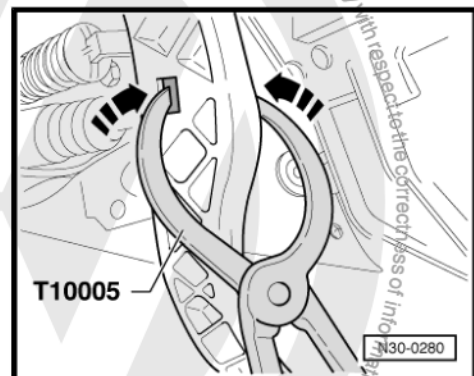
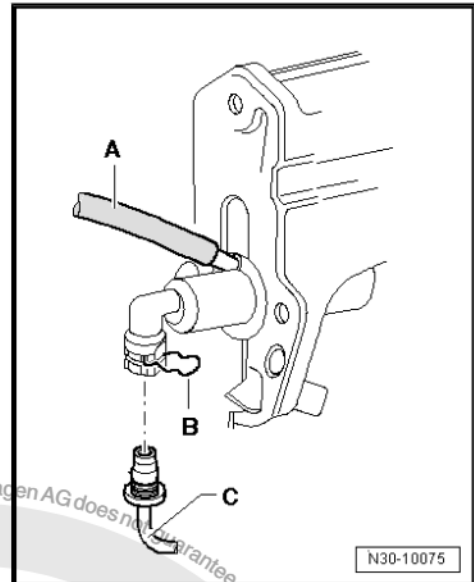
*If the hose is secured with a spring clamp, release it with Standard-type or VW 5162 clamp pliers - VAS 5024A- .*

- Remove clip -B- from the tubing and hose assembly on the transmitting cylinder.
- Remove tubing and hose assembly -C- from the transmitting cylinder and cover it.
- Remove the Clutch pedal switch - F36- ⇒ [page 18](#)



#### Note

- ◆ *The clutch pedal support is removed with the transmitting cylinder.*
- ◆ *Before removal, it is necessary to separate the transmitting cylinder from the clutch pedal.*
- Pull clutch pedal slightly towards front seat and press inwards both sides of the housing with Pliers - T 10005- both sides of the housing inwards -arrows-.
- Separate the transmitting cylinder stem from the clutch pedal's hydraulic drive.





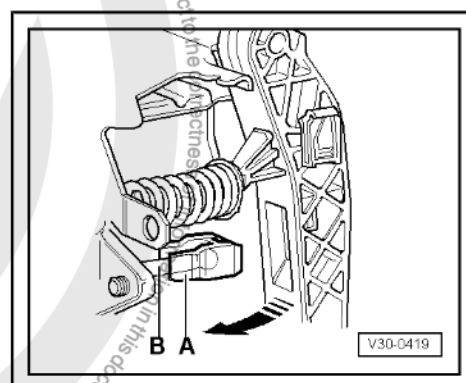
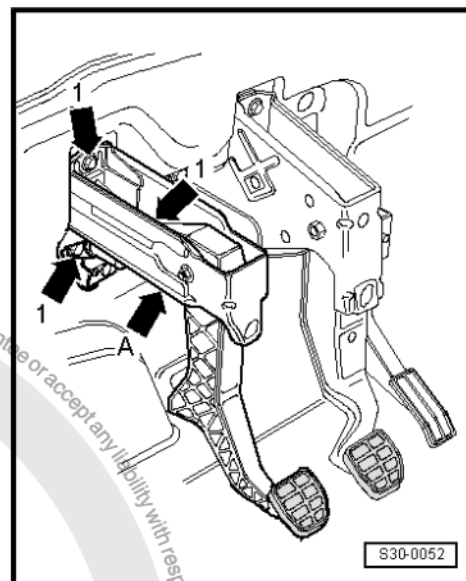


- Loosen the fastening nuts -arrow 1- from the housing support -arrow A-.
- Remove the housing support.
- Remove the cable return spring.
- Remove the return spring housing from the housing support.
- Release the clutch pedal stop.

#### Installation:

Installation is performed in reverse to removal sequence, considering the following:

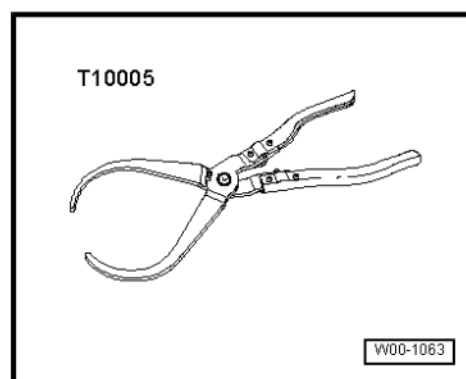
- The housing -A- should be on the transmitting cylinder stem on the clutch hydraulic drive -B-.
- Press clutch pedal -arrow- to fit the drive stem, make sure the fitting is OK.
- Bleed the clutch system ➔ [page 41](#) .
- Fit the clutch pedal switch - F36- ➔ [page 18](#)



### 1.1.7 Clutch pedal - remove install

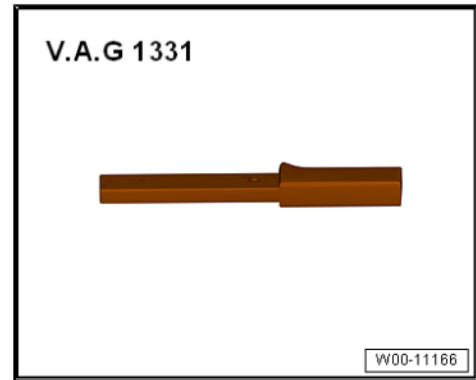
Special tools and workshop equipment required

- ◆ Pliers - T10005-



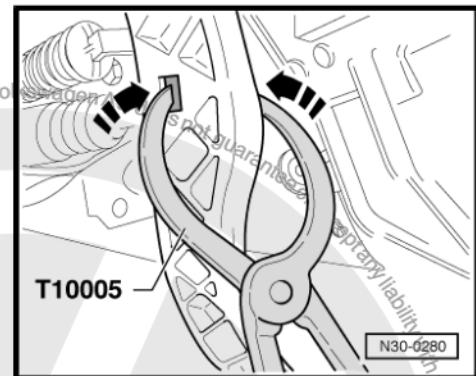


- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-



#### Removal:

- Remove clutch pedal support ➔ [page 21](#) .
- Remove the cable return spring ➔ [page 20](#) .
- Pull clutch pedal slightly towards front seat and press inwards both sides of the housing with Pliers - T 10005- both sides of the housing inwards -arrows-.
- Separate the transmitting cylinder stem from the clutch pedal's hydraulic drive.

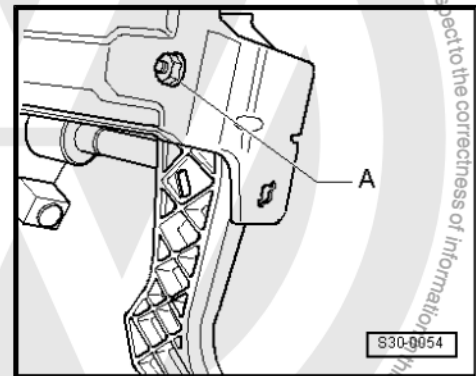


- Loosen nut -A- and remove screw.
- Remove clutch pedal.

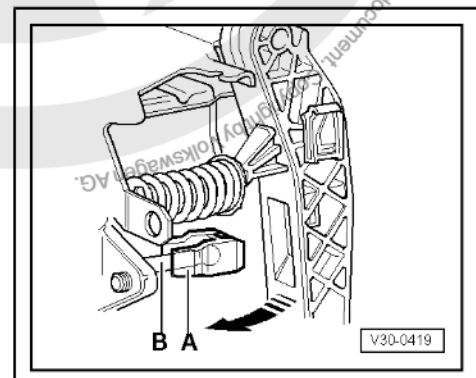
#### Installation:

Installation is performed in reverse to removal sequence, considering the following:

- Install cable return spring ➔ [page 20](#) .



- The housing -A- should be on the transmitting cylinder stem on the clutch hydraulic drive -B-.
- Press clutch pedal -arrow- to fit the drive stem, make sure the fitting is OK.



### 1.1.8 Hydraulic system - assembly overview



1 - Brake fluid reservoir

2 - Supply hose

- ☐ Replace whenever damaged.
- ☐ A flexible plastic tube is installed in some vehicles ⇒ [page 26](#)

3 - Clutch hydraulic drive transmitting cylinder

- ☐ Remove and install ⇒ [page 21](#)

4 - Lock

- ☐ Push to the stop in order to remove and install the pipes and hose assembly

5 - Housing

- ☐ Change only by removing the transmitting cylinder of the clutch hydraulic drive
- ☐ Remove ⇒ [page 26](#)
- ☐ Install ⇒ [page 26](#)

6 - Clutch pedal

- ☐ Remove and install ⇒ [page 23](#)

7 - Hexagonal nut

- ☐ Self-locking
- ☐ 25 Nm
- ☐ Replace after every removal

8 - Seal

- ☐ Fit on cable connection
- ☐ Lubricate with brake fluid

9 - Pipes and hose assembly

10 - Mounting bracket

- ☐ Fastened on body
- ☐ For pipes and hose assembly

11 - Mounting bracket

- ☐ Fastened on the slave cylinder of the clutch hydraulic drive

12 - Hexagon socket head bolt

- ☐ 20 Nm

13 - Clip

- ☐ Push to the stop in order to remove and install the pipes and hose assembly

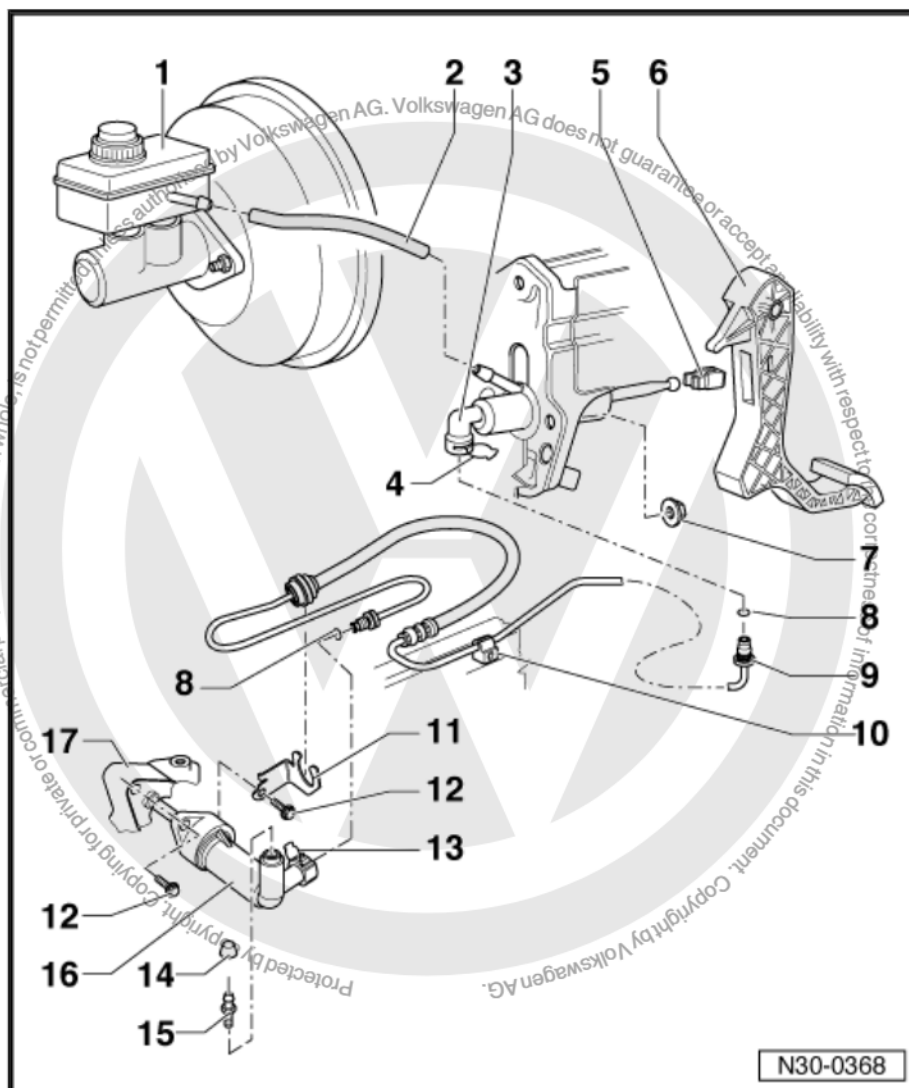
14 - Protection cover

15 - Air bleeding valve

- ☐ Bleed the clutch system ⇒ [page 41](#)

16 - Hydraulic clutch slave cylinder

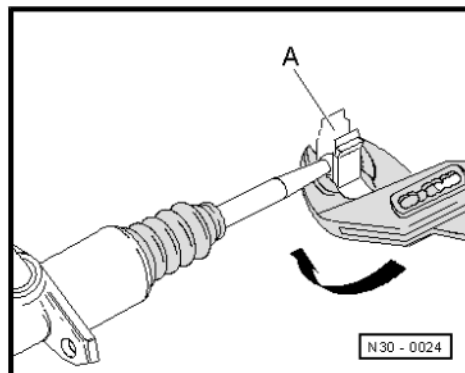
- ☐ Remove and install ⇒ [page 40](#)



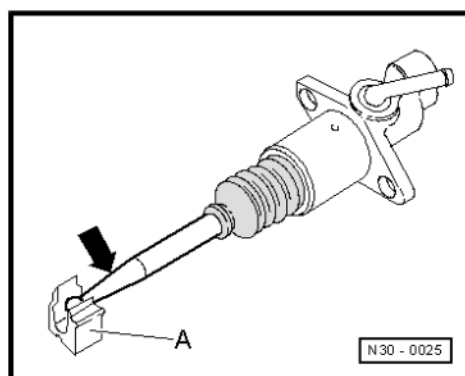


## 17 - Gearbox

Remove housing -A- by leveraging towards arrow

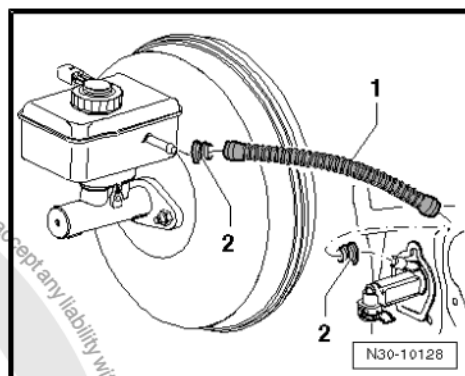


Install housing -A- on the drive stem of the transmitting cylinder of the clutch hydraulic drive, towards arrow



Assembly of the flexible plastic tube -1- in some vehicles

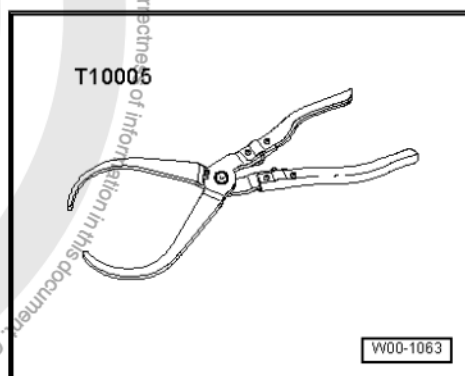
- The gaskets -2- must be on the flexible tube.
- Check Assignment in the ⇒ Electronic Parts Catalogue "ETKA"



### 1.1.9 Transmitting cylinder - clutch hydraulic drive - remove and install

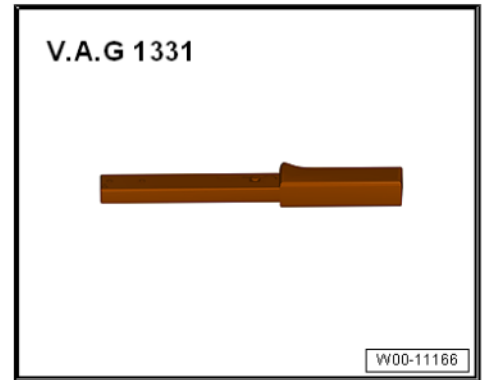
Special tools and workshop equipment required

- ◆ Pliers - T 10005-





- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-



#### Removal:

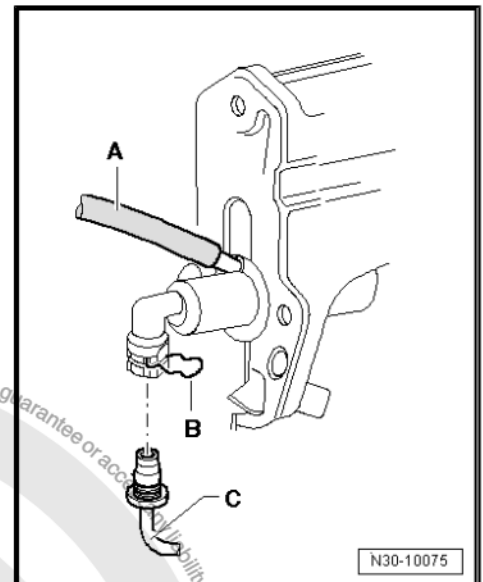
- Disconnect the Battery - A- ⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .
- Pull the harness carefully forwards.
- Place a lint-free cloth sufficiently large under the transmitting cylinder of the clutch hydraulic drive.
- Install Clamp (diam.25 mm) - 3094- on the return hose -A- and release it from the transmitting cylinder.



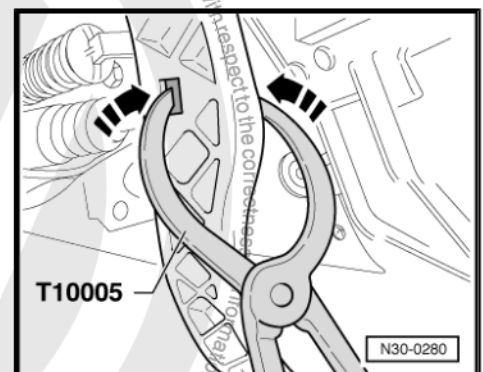
#### Note

*If the hose is secured with a spring clamp, release it with Standard-type or VW 5162 clamp pliers - VAS 5024A- .*

- Remove clip -B- from the tubing and hose assembly on the transmitting cylinder.
- Remove tubing and hose assembly -C- from the transmitting cylinder and cover it.
- Remove the Clutch pedal switch - F36- ➔ [page 18](#)



- Pull clutch pedal slightly towards front seat and press inwards both sides of the housing with Pliers - T 10005- both sides of the housing inwards -arrows-.
- Separate the transmitting cylinder stem from the clutch pedal's hydraulic drive.



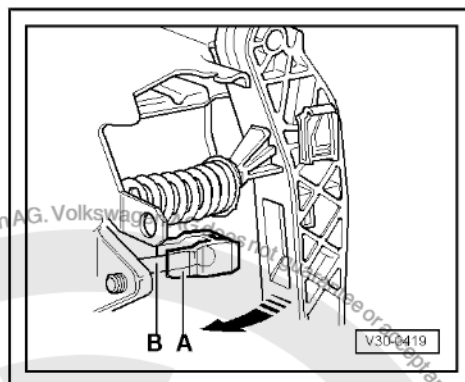
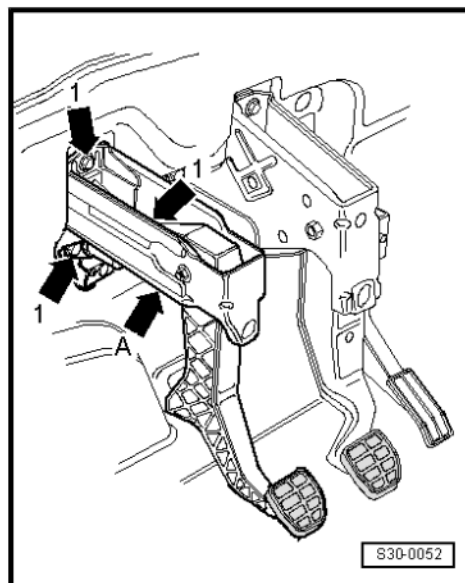


- Loosen the fastening nuts -arrow 1- from the housing support -arrow A-.
- Remove the housing support.
- Remove the cable return spring.
- Remove the return spring housing from the housing support.
- Release the clutch pedal stop.
- Remove the transmitting cylinder on the clutch hydraulic drive.

#### Installation:

Installation is performed in reverse to removal sequence, considering the following:

- Install cable return spring.
- The housing -A- should be on the transmitting cylinder stem on the clutch hydraulic drive -B-.
- Press clutch pedal -arrow- to fit the drive stem, make sure the fitting is OK.
- Bleed the braking system after installing the gear cylinder  
⇒ [page 41](#) .



## 1.2 Control mechanism - (version 2)

⇒ ["1.2.1 Command system \(version 2\) - component overview", page 28](#)

⇒ ["1.2.2 Command pedals - assembly overview", page 29](#)

⇒ ["1.2.3 Hydraulic system - assembly overview", page 31](#)

⇒ ["1.2.4 Clutch pedal return spring - remove and install", page 33](#)

⇒ ["1.2.5 Clutch pedal support - remove and install", page 35](#)

⇒ ["1.2.6 Clutch pedal - remove and install", page 37](#)

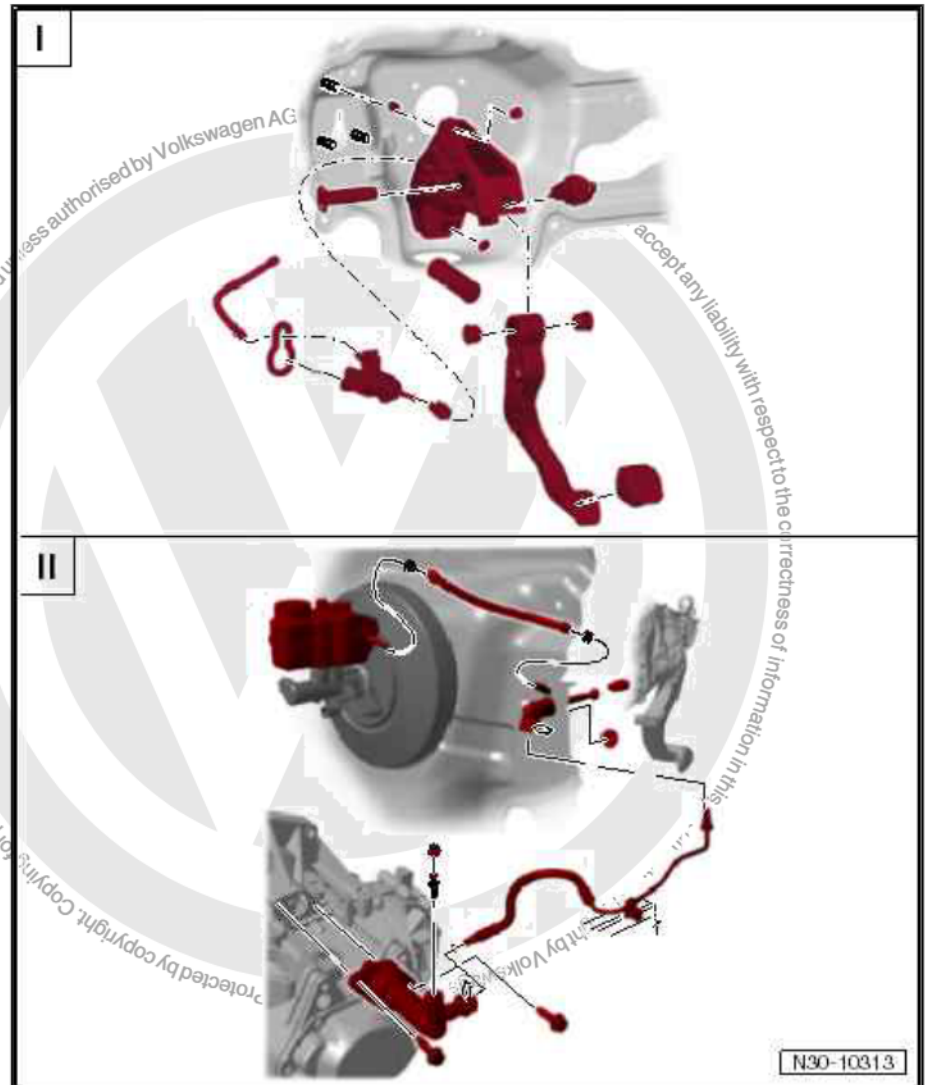
### 1.2.1 Command system (version 2) - component overview





I - Command pedals - assembly overview ➔ [page 29](#)

II - Hydraulic system - assembly overview ➔ [page 31](#)



### 1.2.2 Command pedals - assembly overview



#### WARNING

*Self-locking screws/nuts must be replaced whenever loosened and/or removed.*



1 - Engine compartment's partition panel

- ☐ With housing for the clutch support and master gear cylinder

2 - Bushing

- ☐ For the upper clutch pedal support housing
- ☐ Bushings with smaller assembly holes, located in the clutch hydraulic drive gear cylinder

3 - Clutch pedal support

- ☐ To remove and install the gear cylinder on the clutch hydraulic drive  
⇒ [page 35](#)

4 - Hexagonal nut

- ☐ Self-locking
- ☐ 25 Nm
- ☐ 3 units
- ☐ Replace after every removal

5 - Impact absorption bar

- ☐ Fastened to the steering column
- ☐ Assignment: ⇒ Electronic Parts Catalogue "ETKA" .

6 - Bolt

- ☐ 20 Nm

7 - Limiter stop

- ☐ For clutch pedal

8 - Bearing pin

- ☐ Replace after every removal

9 - Pedal return spring

- ☐ Remove and install ⇒ [page 33](#)

10 - Clutch pedal

- ☐ Remove and install ⇒ [page 37](#)

11 - Bearing bushes

12 - Clutch pedal cover

- ☐ Replace if damaged

13 - Housing

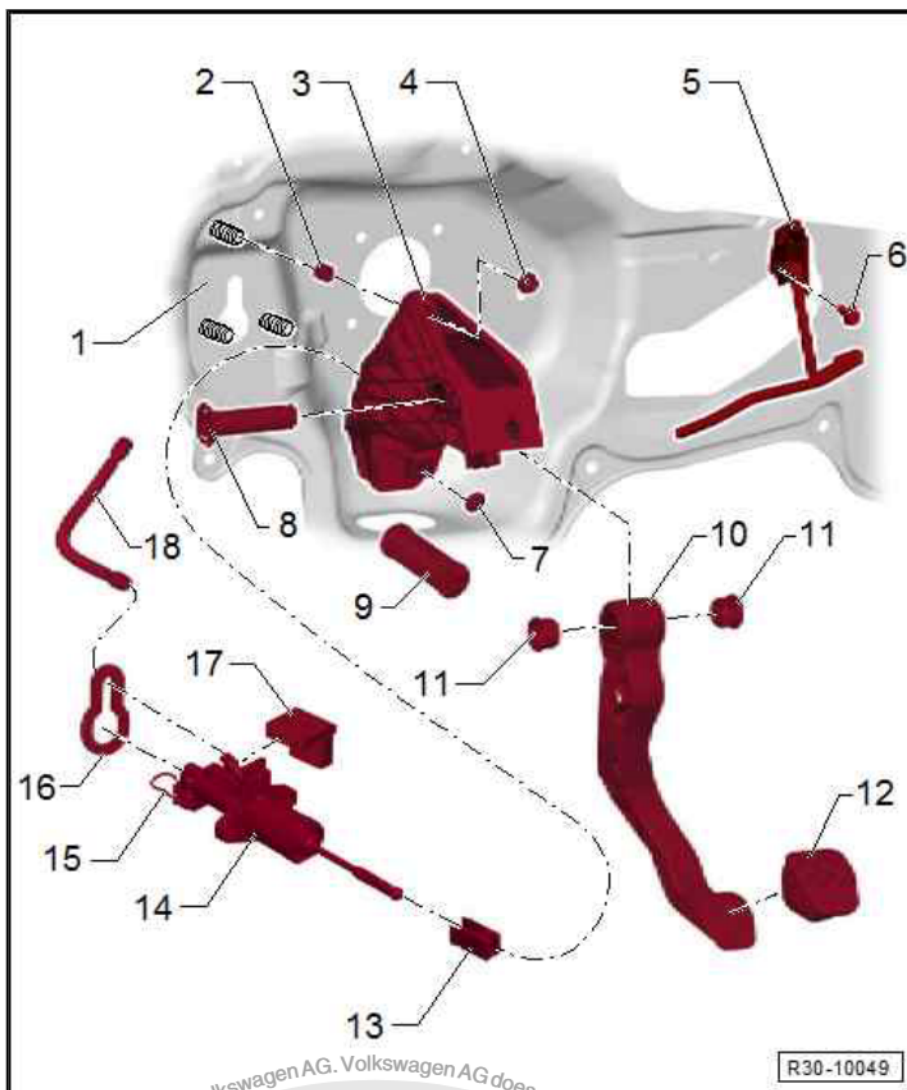
- ☐ May be removed with the clutch hydraulic drive gear cylinder installed
- ☐ Remove ⇒ [page 33](#)
- ☐ Install ⇒ [page 33](#)

14 - Clutch hydraulic drive transmitting cylinder

- ☐ Remove and install ⇒ [page 40](#)

15 - Clip

- ☐ Release the lock until the stop to remove and install hydraulic piping







## 16 - Sealing

- ☐ Always replace
- ☐ Attached to the clutch hydraulic drive gear cylinder

## 17 - Clutch position sensor - G476-

- ☐ Assignment: ⇒ Electronic Parts Catalogue "ETKA" .

## 18 - Piping (plastic)

- ☐ Assembly in the flexible plastic tube ⇒ [page 26](#)

## 1.2.3 Hydraulic system - assembly overview

### Assembly overview (plastic piping)

#### 1 - Sealing gaskets

#### 2 - Piping (plastic)

- ☐ Assembly in the flexible plastic tube ⇒ [page 26](#)

#### 3 - Engine compartment's partition panel

#### 4 - Housing

- ☐ Change only by removing the transmitting cylinder of the clutch hydraulic drive.
- ☐ Remove ⇒ [page 26](#)
- ☐ Install ⇒ [page 26](#)

#### 5 - Clutch pedal

- ☐ Remove and install ⇒ [page 37](#) .

#### 6 - Hexagonal nut

- ☐ Self-locking.
- ☐ 3 units.
- ☐ 25 Nm.
- ☐ Replace after each removal.

#### 7 - Clutch hydraulic drive transmitting cylinder

- ☐ Remove and install ⇒ [page 40](#) .

#### 8 - Clip

- ☐ Push until the stop to remove and install the pipes.

#### 9 - Piping (plastic)

- ☐ Assignment: ⇒ Electronic Parts Catalog "ETKA"

#### 10 - Hydraulic clutch slave cylinder

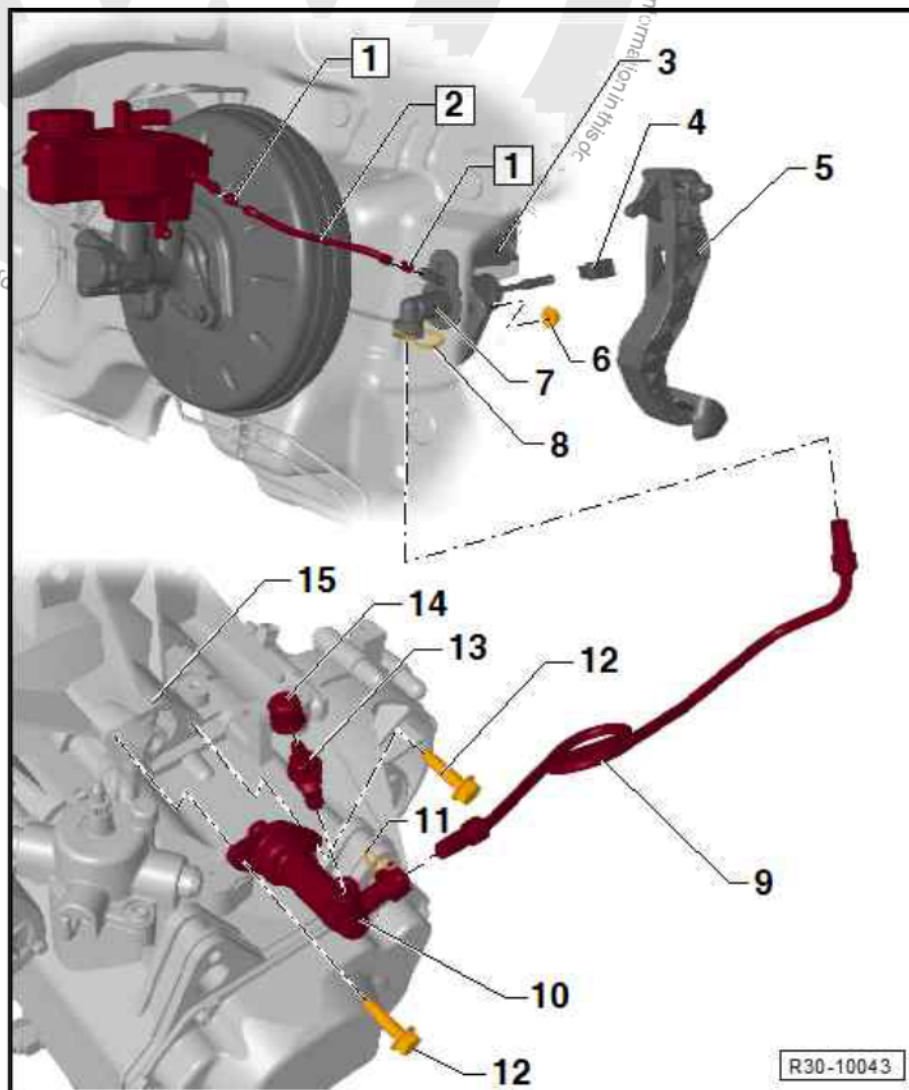
- ☐ Remove and install ⇒ [page 40](#) .

#### 11 - Clip

- ☐ Push until the stop to remove and install the pipes.

#### 12 - Bolts

- ☐ 20 Nm.





- ☐ Replace after each removal.

13 - Air bleeding valve

- ☐ Bleed the steering system ➔ [page 41](#) .

14 - Protection cover

15 - Gearbox

Assembly overview (metallic piping and hose)

1 - Sealing gaskets

2 - Piping (plastic)

- ☐ Assembly in the flexible plastic tube ➔ [page 26](#)

3 - Engine compartment's partition panel

4 - Housing

- ☐ Change only by removing the transmitting cylinder of the clutch hydraulic drive.

- ☐ Remove ➔ [page 26](#)

- ☐ Install ➔ [page 26](#)

5 - Clutch pedal

- ☐ Remove and install ➔ [page 37](#) .

6 - Hexagonal nut

- ☐ Self-locking.
- ☐ 3 units.
- ☐ 25 Nm.
- ☐ Replace after each removal.

7 - Clutch hydraulic drive transmitting cylinder

- ☐ Remove and install ➔ [page 40](#) .

8 - Clip

- ☐ Push to the stop in order to remove and install the pipes and hose assembly.

9 - Piping (metallic and hose)

- ☐ Assignment: ➔ Electronic Parts Catalog "ETKA"

10 - Mounting bracket

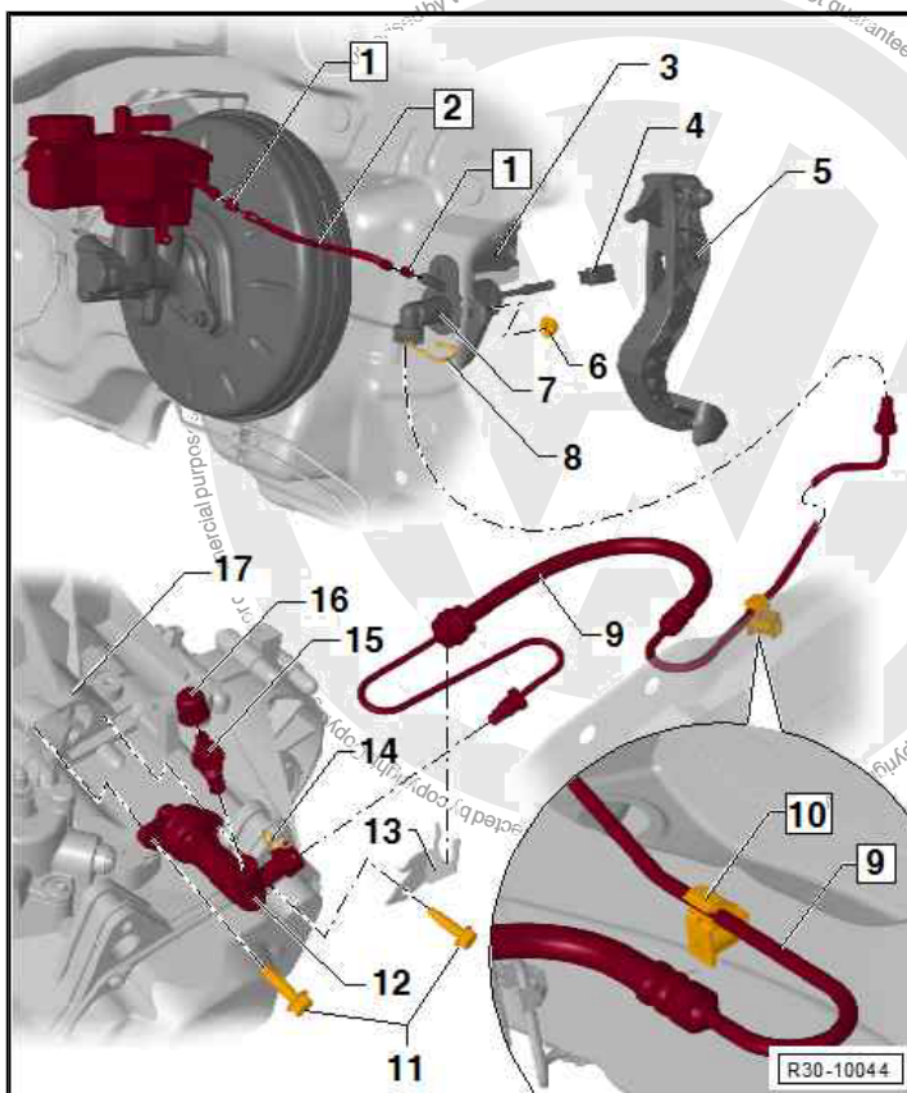
- ☐ Fastened on body.
- ☐ For the piping set.

11 - Bolts

- ☐ 20 Nm.
- ☐ Replace after each removal.

12 - Hydraulic clutch slave cylinder

- ☐ Remove and install ➔ [page 40](#) .





### 13 - Mounting bracket

- ☐ Fastened on the slave cylinder of the clutch hydraulic drive.

### 14 - Clip

- ☐ Push to the stop in order to remove and install the pipes and hose assembly.

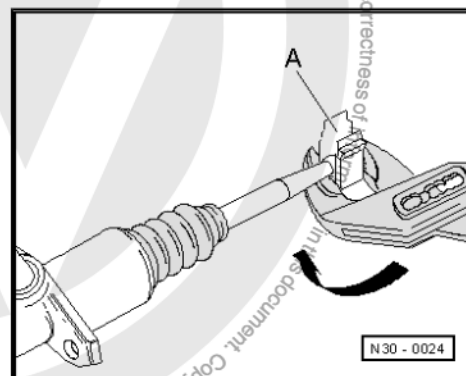
### 15 - Air bleeding valve

- ☐ Bleed the steering system ⇒ [page 41](#) .

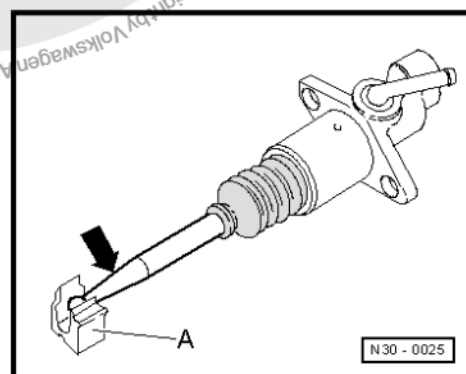
### 16 - Protection cover

### 17 - Gearbox

Remove housing -A- by leveraging towards arrow

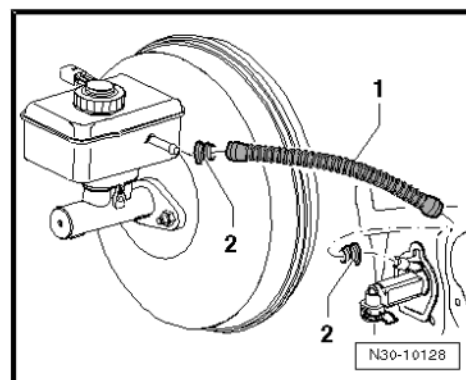


Install housing -A- on the drive stem of the transmitting cylinder of the clutch hydraulic drive, towards arrow



Assembly in the flexible plastic tube -1-

- The gaskets -2- must be on the flexible tube.
- Assignment: ⇒ Electronic Parts Catalog "ETKA"



## 1.2.4 Clutch pedal return spring - remove and install

Special tools and workshop equipment required



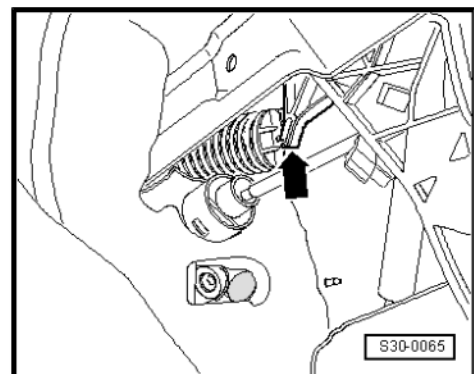
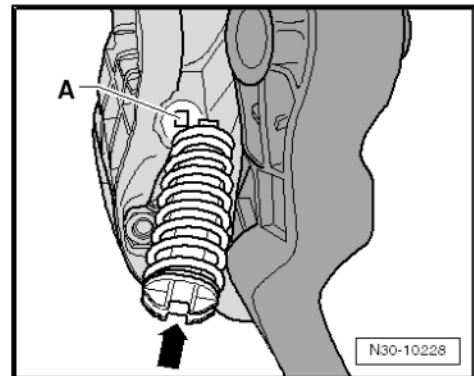
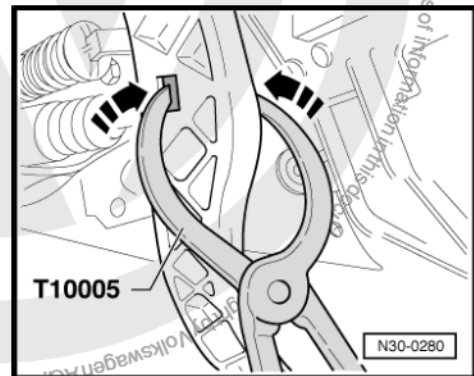
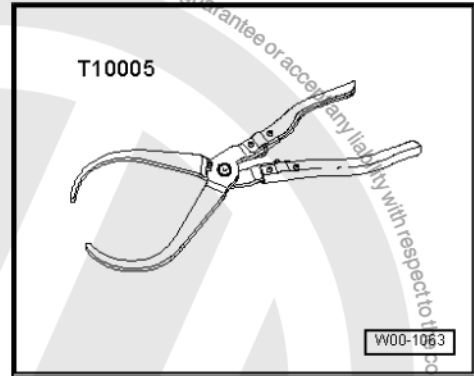
◆ Pliers - T10005-

Removal

- Release the master cylinder clutch pedal with the Pliers - T10005- .
- Remove the pedal support return spring.

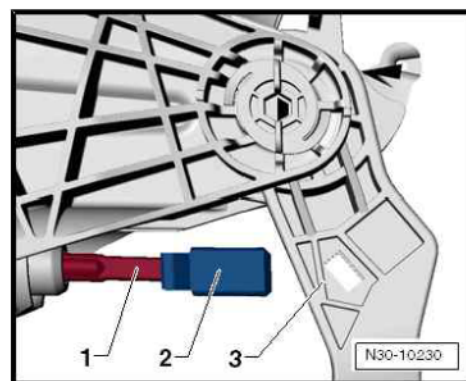
Installation

- Place the pedal return spring laterally from underneath, along with the gear cylinder rod and the pedal support -A-.
- Install the pedal return spring in the clutch pedal support -arrow-.





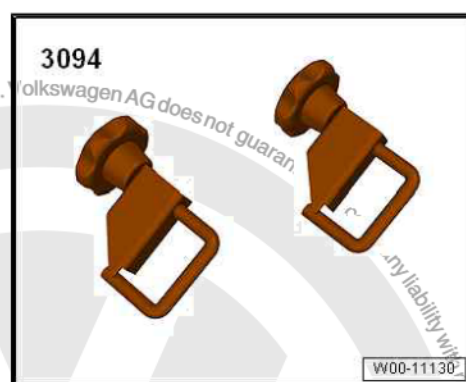
- Ensure that the housing -2- is located in rod -1-.
- Press the set (housing), until an audible fitting sound is heard in the clutch pedal crease -3-.



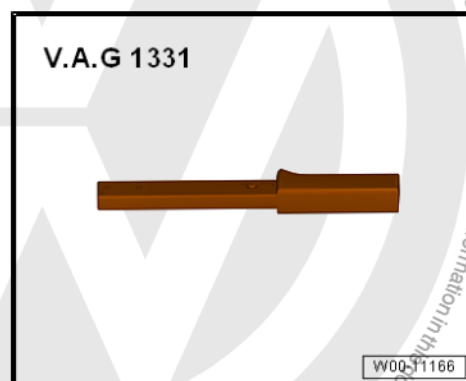
### 1.2.5 Clutch pedal support - remove and install

Special tools and workshop equipment required

- ◆ Clamps (diameter 25 mm) - 3094-



- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-



- ◆ Buffer set - T10249-







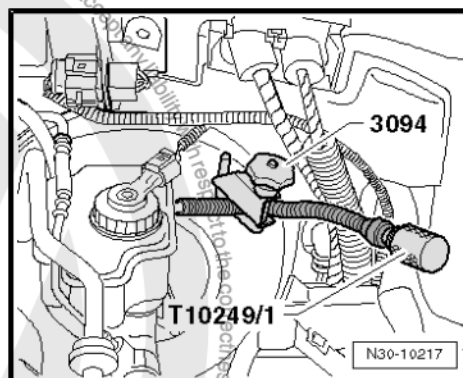
#### Removal:

- Remove the air filter in case of difficulty accessing the master cylinder ⇒ Engine; Rep. gr. 24 ; Fuel supply - injection system .

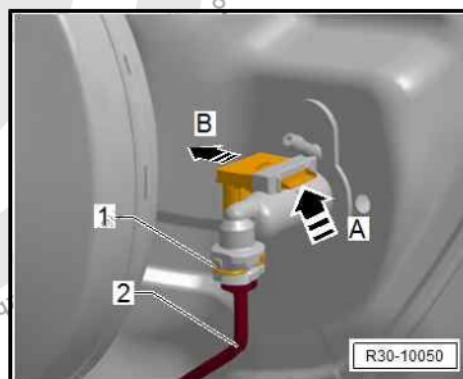


#### Note

- ♦ *For the following operations, ensure that fluid is not spilled over the gearbox or body. Otherwise, clean the affected region thoroughly.*
- ♦ *Place a lint-free cloth under the clutch drive gear cylinder.*
- Install Clamp (diam. 25 mm) - 3094- on the return hose and release it from the transmitting cylinder.
- Use the Buffer set - T10249/1- , to completely restrict the return hose.



- Unlock the Clutch position sensor - G476- -arrow A- and -arrow B- of the transmitting cylinder.
- Remove the Clutch position sensor - G476- from the transmitting cylinder, while the electrical harness is connected.
- Release the fastening clamp -1-, using a screwdriver.
- Disconnect hose -2- of the transmitting cylinder.



#### Note

*When performing activities near the feet area (next to the clutch pedal), protect the floor lining (rug) with cloths in order to prevent potential brake fluid contamination.*

- Remove the fastening nuts -1- and -2-.
- Remove clutch pedal support -3-.

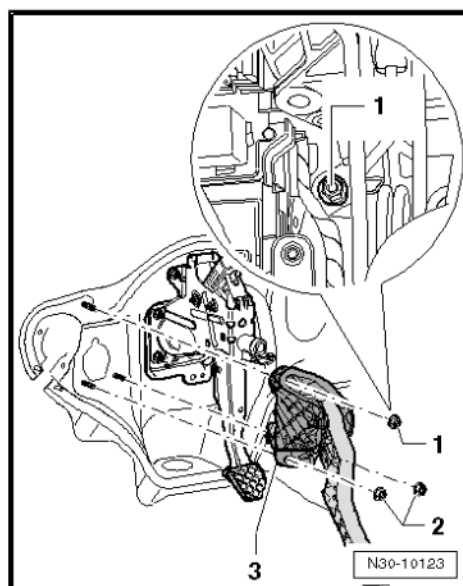
#### Installation:

Installation is performed in reverse to the removal sequence, observing the following:



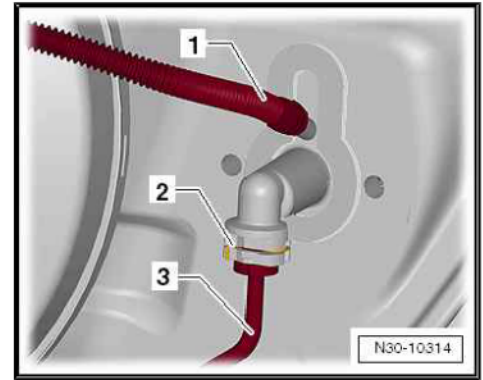
#### Note

- ♦ *Replace the sealing applied in the clutch hydraulic drive transmitting cylinder.*
- ♦ *Always replace self-locking nuts.*





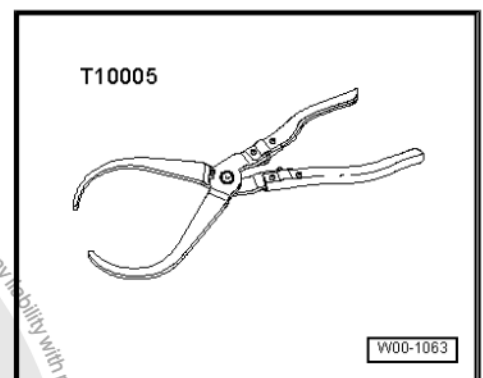
- Remove the Clamp (diam.25 mm) - 3094- from the return hose and, if necessary, bend the supply hose -1- back to its original shape (original contour).
- Press the tube -3- in the cylinder connection until an audible fastening sound is heard in clamp -2-.
- Install the Clutch position sensor - G476- in the transmitting cylinder.
- Bleed the clutch system ➔ [page 41](#) .
- If removed, install the air filter ➔ Engine; Rep. gr. 24 ; Fuel supply - injection system .



## 1.2.6 Clutch pedal - remove and install

Special tools and workshop equipment required

- ◆ Pliers - T10005-

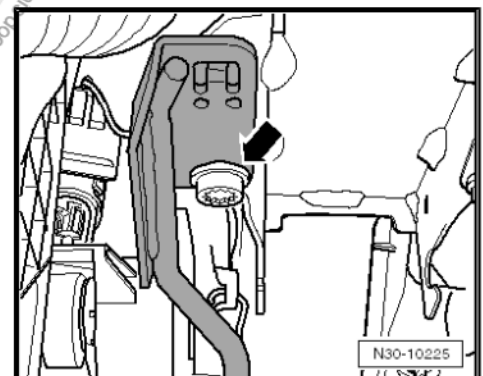


### Note

- ◆ Always replace the bearing pin ➔ [Item 8 \(page 30\)](#) .
- ◆ If only the return spring must be removed, do not remove the clutch pedal.

### Removal:

- Remove the air duct for front feet (left side) ➔ Heating, air conditioning; Rep. gr. 80 ; Heating .
- Remove the fastening bolt -arrow- and remove the impact absorption bar.

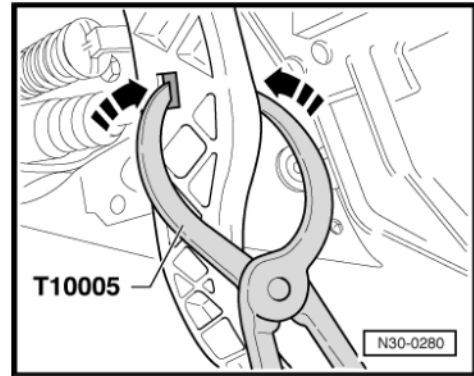






- Release the master cylinder clutch pedal with the Pliers - T10005- .
- Remove the clutch pedal support spring.

Remove the clutch pedal bearing pin as detailed below:



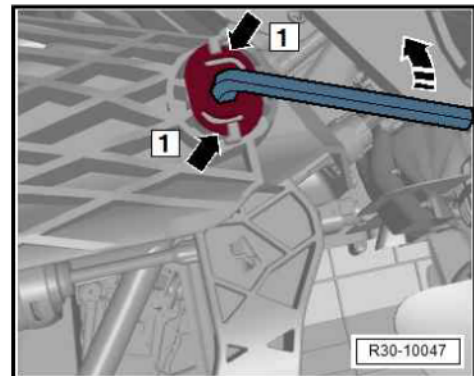
- Turn the clutch pedal bearing pin using an Allen wrench (10 mm) in the direction of the -arrow-.

The locks -arrows 1- will be damaged.

- Move the clutch pedal in order to remove the clutch pedal bearing pin.
- Remove the clutch pedal.

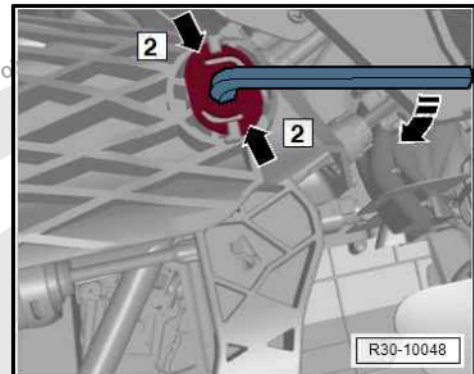
Installation:

- Install the clutch pedal using a new bearing pin.
- Install the new clutch pedal bearing pin as detailed below:

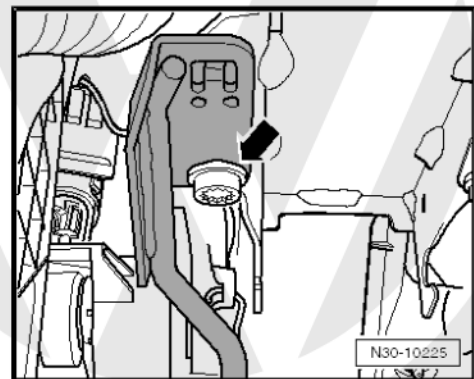


- Turn the clutch pedal bearing pin using an Allen wrench (10 mm) in the direction of the -arrow-.

- The locks -arrows 2- are the respective stops.
- Install the clutch pedal return spring ➔ [page 33](#) .



- Install and tighten the fastening bolt -arrow- of the impact absorption bar.





## 2 Clutch drive mechanism

⇒ "2.1 Clutch drive mechanism - assembly overview", page 39

⇒ "2.2 Clutch slave cylinder - remove and install", page 40

⇒ "2.3 Clutch drive mechanism - bleed", page 41

### 2.1 Clutch drive mechanism - assembly overview



#### WARNING

- ◆ When handling chemicals follow the safety instructions ⇒ *Chemical Products Manual; Rep. gr. 00*
- ◆ Assignment of Chemical Materials ⇒ *Electronic Parts Catalogue "ETKA"*

#### 1 - Clutch roller bearing

- ☐ Remove and install with the clutch release lever  
⇒ [Item 3 \(page 39\)](#)  
and roller bearing guide bushing  
⇒ [Item 5 \(page 39\)](#)
- ☐ Do not wash the clutch roller bearing, just clean it with a cloth
- ☐ Change damaged roller bearings

#### 2 - Bolt

- ☐ 5 Nm + 90°
- ☐ Replace after every removal

#### 3 - Clutch release lever

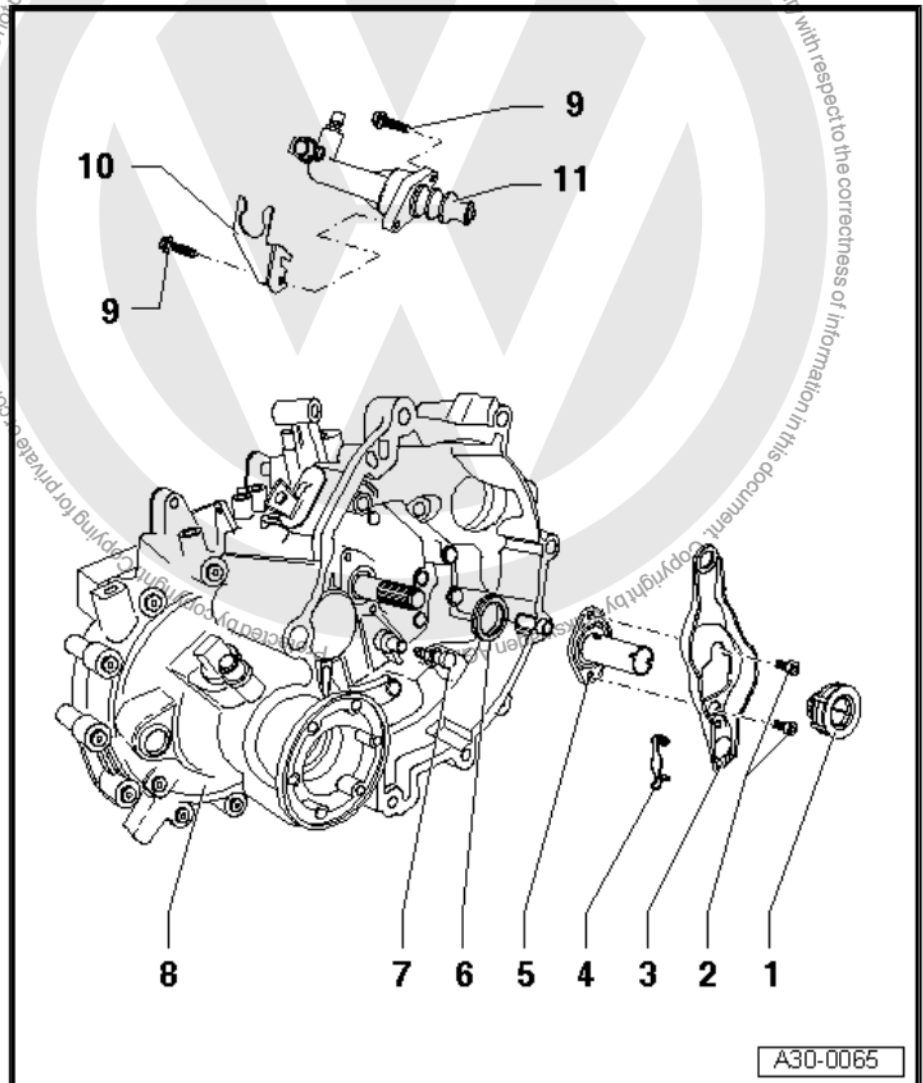
- ☐ Remove and install  
⇒ [page 40](#)
- ☐ Remove and install with the clutch roller bearing  
⇒ [Item 1 \(page 39\)](#) and roller bearing's guide bushing  
⇒ [Item 5 \(page 39\)](#)
- ☐ Lubricate the touching point on the spherical pin with Lubricating grease - G 000 100- .

#### 4 - Lever pressure lever

- ☐ Fasten on the clutch lever

#### 5 - Roller bearing's guide bushing

- ☐ Remove and install  
⇒ [page 40](#)
- ☐ Remove and install with the clutch roller bearing ⇒ [Item 1 \(page 39\)](#) and roller bearing's disengaging lever ⇒ [Item 3 \(page 39\)](#)





6 - Sealing ring for input shaft

- ❑ Replace ➔ [page 125](#)

7 - Ball pin

- ❑ 20 Nm
- ❑ Lubricate with Lubricating grease - G 000 100- .

8 - Gearbox

9 - Bolt

- ❑ 20 Nm

10 - Mounting bracket

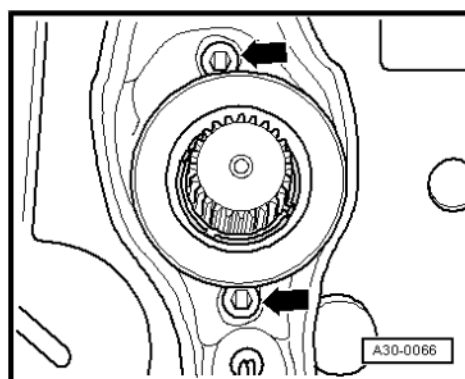
11 - Slave cylinder

- ❑ Remove and install ➔ [page 40](#)
- ❑ Lubricate the stem tip with Lubricating grease - G 000 100- .

Removing and installing the clutch lever with the clutch bearing and bearing guide

- Loosen the bolts -arrows-.
- Separate clutch lever, with the clutch lining and guide bushing, from input shaft and ball-head pin.

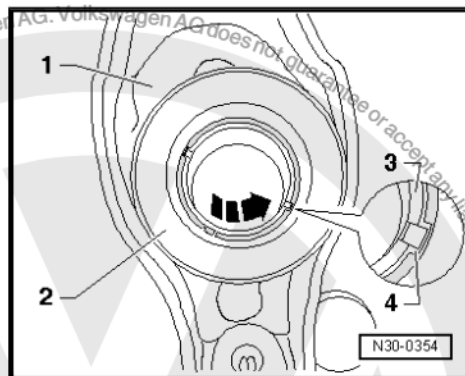
Installation is performed in reverse to removal sequence.



Removing and installing the bearing's guide bushing

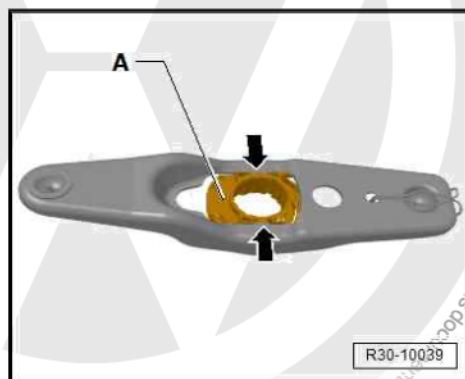
- Displace the guide bushing -3- from the clutch lining -2- by pushing it upwards.
- While securing the collar -2-, turn guide bushing -3- 90° towards arrow, until its fitting edges match the slots -4- on collar.
- Remove guide bushing from collar.

Installation is performed in reverse to removal sequence.



Removing and installing clutch lining

- Compress the fitting edges -arrows- located on the rear part of the clutch lever, and pull collar -A- out of the lever.
- To install collar -A-, engage it on the clutch lever until fitting the edges -arrows- .

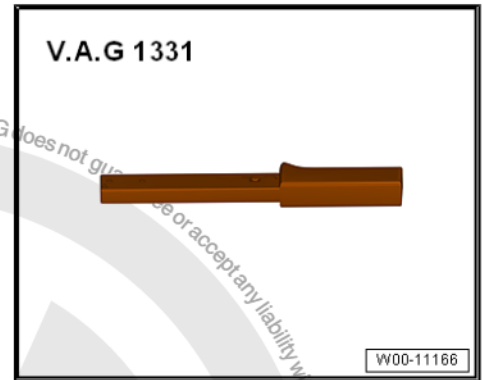


## 2.2 Clutch slave cylinder - remove and install

Special tools and workshop equipment required

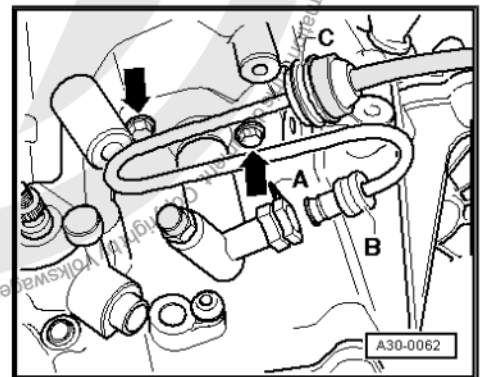


- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-



#### Removal

- Disconnect the Battery - A- ⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .
- When the air filter is installed behind the Battery - - , the ⇒ motor of the fuel supply system; Rep. gr. 24 ; Supply system - fuel injection must also be removed.
- Place a sufficiently large lint-free cloth under the clutch slave cylinder.
- Remove the clip -A- on the drive receiving cylinder, which fastens the tubes and hose.
- Remove the tubing and hose assembly from the housing -C- on gearbox.
- Separate the tubing and hose assembly -B- from the drive receiving cylinder and cover the open ends.
- Loosen screws on cylinder -arrows- and remove it.



#### Installation

Installation is performed in reverse to removal sequence, considering the following:

- Bleed the clutch system after installing the receiving cylinder ⇒ [page 41](#) .

## 2.3 Clutch drive mechanism - bleed

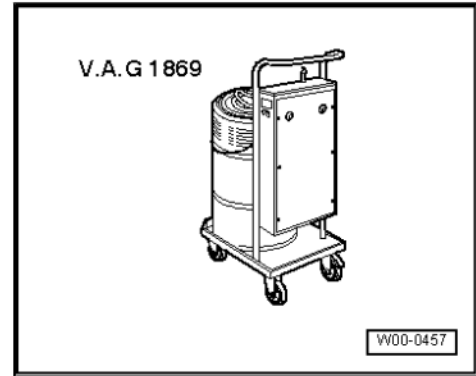
Special tools and workshop equipment required

- ◆ Brake filling and bleeding equipment - VAS 5234-





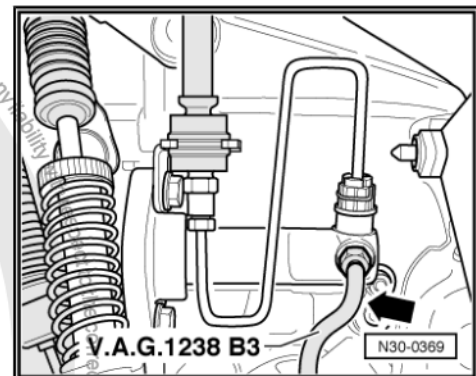
◆ Brake bleeding device - V.A.G 1869-



Note

*System pre-filling is not required*

- When required, use 670-mm long hose - 1238/B3 - .
- Connect the bleeder hose to the Brake filling and bleeding equipment - VAS 5234- or Brake bleeding device - V.A.G 1869- .
- Install the bleeder hose on the impelling cylinder -arrow- and open the bleeding valve.
- Pressurize the system to 2 bar.
- Open the bleeding valve.
- Bleed approximately 100 cm<sup>3</sup> of brake fluid.
- Press quickly the pedal from stop to stop, 10 to 15 times.
- Let bleed additional 50 cm<sup>3</sup> of brake fluid.
- Close the bleeding valve.
- Press the clutch pedal several times.







### 3 Clutch

⇒ ["3.1 Clutch - assembly overview", page 43](#)

⇒ ["3.2 Clutch - repair", page 45](#)

#### 3.1 Clutch - assembly overview



##### WARNING

- ◆ *When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00*
- ◆ *Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"*



##### Note

- ◆ *Change clutch plates and plate with damaged or loosened riveted unions.*
- ◆ *The clutch plate and plate must correspond each other according to the ⇒ Electronic Part Catalogue "ETKA" and the engine prefixes.*





#### 1 - Flywheel

- ☐ Pay attention to perfect fitting of the guide pins
- ☐ The contact surface of the clutch plate should be free of oil and grease, and should not have grooves
- ☐ Remove and install ⇒ Engine; Rep. gr. 13 ; Crankshaft, pistons

#### 2 - Clutch plate

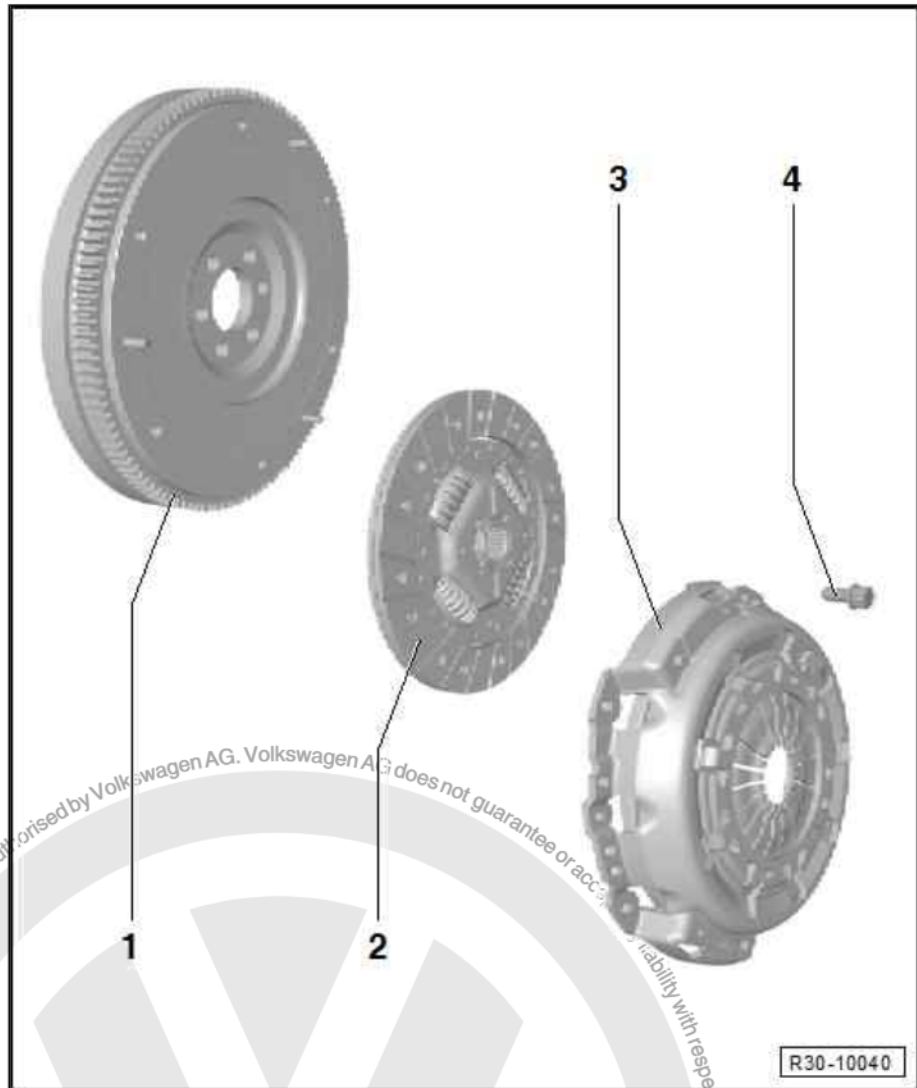
- ☐ Installation position: the spring case should be facing the clutch plate
- ☐ Centre the clutch disc ⇒ [page 45](#)
- ☐ Apply a slight coat of grease on the splines
- ☐ Clean the splines on the input shaft and the clutch plate hub used
- ☐ Eliminate corrosion and apply a thin coat of Lubricating grease - G 000 100- on the input shaft's splines. Move the clutch plate on the input shaft to one side and other until the hub slides smoothly on the shaft. Eliminate excess grease.

#### 3 - Clutch plate

- ☐ Remove and install ⇒ [page 45](#)
- ☐ Check the membrane spring ⇒ [page 46](#)
- ☐ The clutch plates are greased and protected against corrosion. Clean the contact surface only; otherwise, the clutch lifetime will be significantly reduced

#### 4 - Bolt

- ☐ 20 Nm
- ☐ Loosen and tighten in a cross and phased pattern

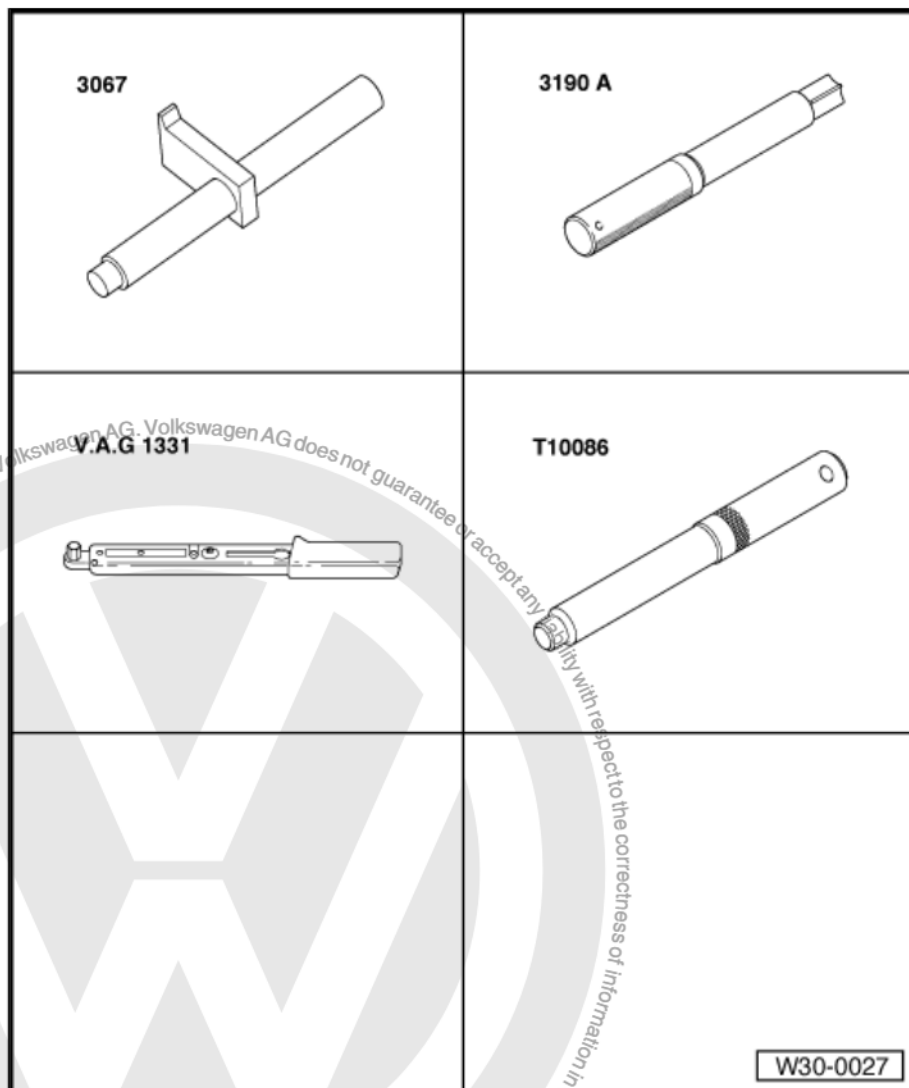






## 3.2 Clutch - repair

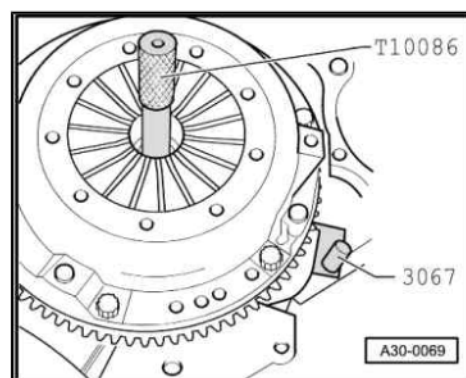
Special tools and workshop equipment required



- ◆ Lock - 3067-
- ◆ Guide pin - 3190A-
- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-
- ◆ Guide Pin - T 10086-

Centre the clutch disc using the Guide Pin - T 10086- - remove and install the clutch plate

or





Centre the clutch disc using the Guide Pin - 3190A- - remove and install the clutch plate

- Loosen and tighten screws in a cross and phased pattern.
- To remove, install Lock - 3067 - .



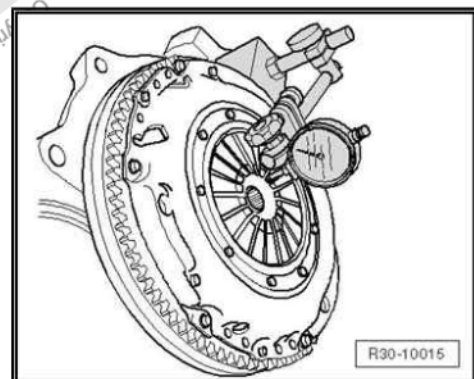
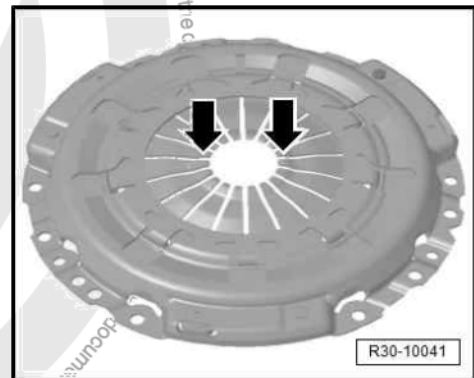
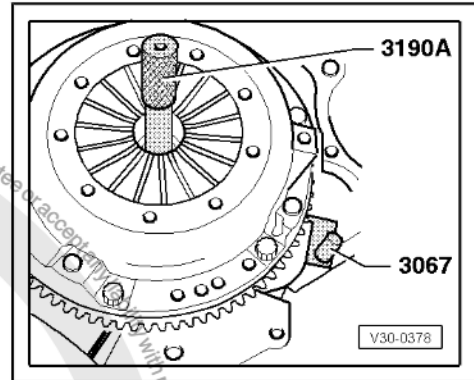
#### Note

- ◆ *The clutch plate and clutch plate contact surfaces must be completely seated on the engine's flywheel.*
- ◆ *Tighten evenly the fastening screws, in a cross pattern, to prevent damages on the membrane spring of the clutch plate and the guide pins of the engine's flywheel.*

Check membrane spring height

- Wear until half of the membrane spring thickness is permitted.
- Install the clutch ⇒ [Item 3 \(page 44\)](#) .

- Fasten centesimal dial gauge support somewhere on the cylinder block.
- Reset centesimal dial gauge to zero in one of the clutch plate membrane spring tabs.
- Measure height of each tab and write down the values.
- Consider the highest and lowest values found.
- The sum of obtained values on the right and left of the zero point at the centesimal dial gauge should not be higher than 0.80 mm. Otherwise, replace it.





## 34 – Controls, housing

### 1 Shift mechanism

⇒ [“1.1 Shift mechanism - installation position”, page 47](#)

⇒ [“1.2 Selector mechanism - component overview”, page 49](#)

⇒ [“1.3 Drive cables”, page 51](#)

⇒ [“1.4 Handle and boot on the gear lever - assembly overview”, page 59](#)

⇒ [“1.5 Handle and boot on the gear lever - remove and install”, page 60](#)

⇒ [“1.6 Handle and boot on the gear lever - disassemble and assemble”, page 61](#)

⇒ [“1.7 Gear shift lever and shifting mechanism - remove and install”, page 62](#)

⇒ [“1.8 Gearshift lever and mechanism - repair”, page 66](#)

⇒ [“1.9 Lever and Gear shifting mechanism - adjusting”, page 68](#)

⇒ [“1.10 Selector and lever - functional check”, page 70](#)

#### 1.1 Shift mechanism - installation position

-Arrow A- gear selection movement

-Arrow B- track selection mechanism





A - Gear selector cable

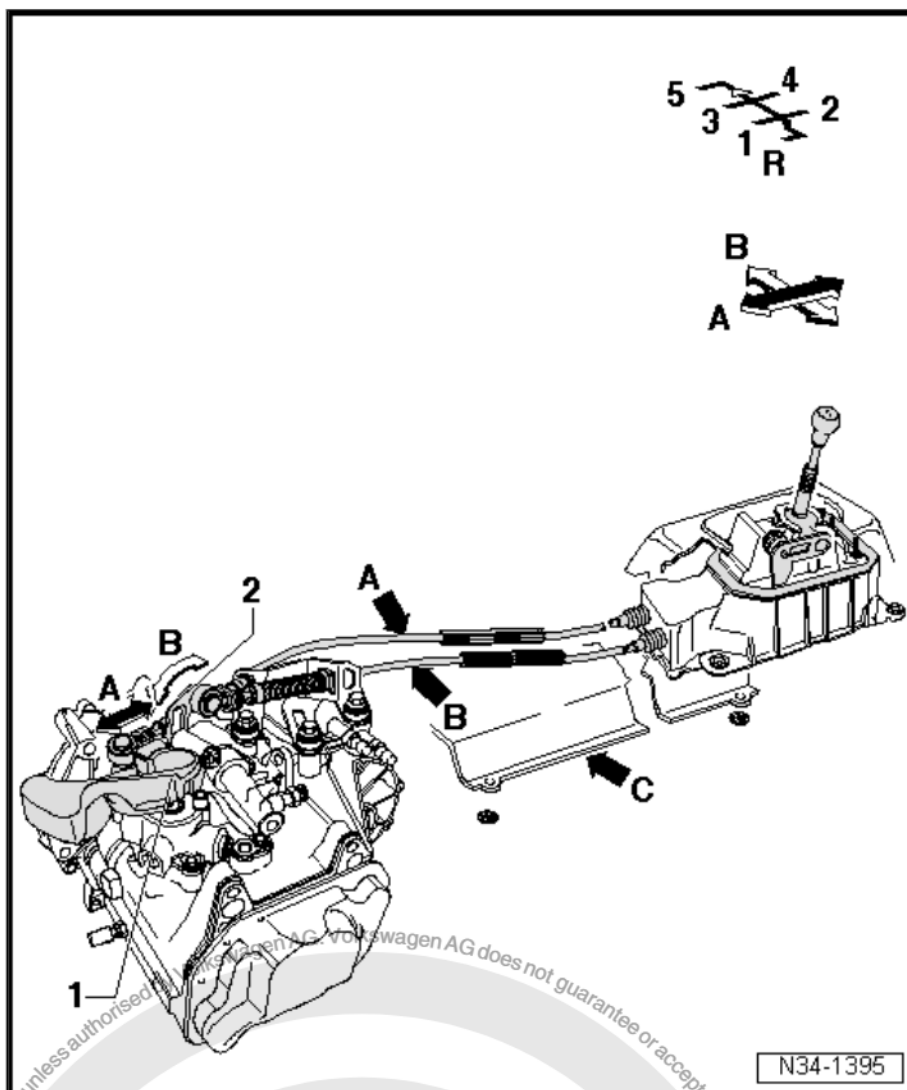
B - Track selector cable

C - Heat shield

- ☐ It should be removed before removing the shift mechanism

1 - Gearbox selector lever

2 - Inversion lever





## 1.2 Selector mechanism - component over-view

⇒ ["1.2.1 Selector mechanism - \(version 1\)", page 49](#)

⇒ ["1.2.2 Selector mechanism - \(version 2\)", page 50](#)

⇒ ["1.2.3 Selector mechanism - \(version 3\)", page 51](#)

### 1.2.1 Selector mechanism - (version 1)

#### I - Drive cables

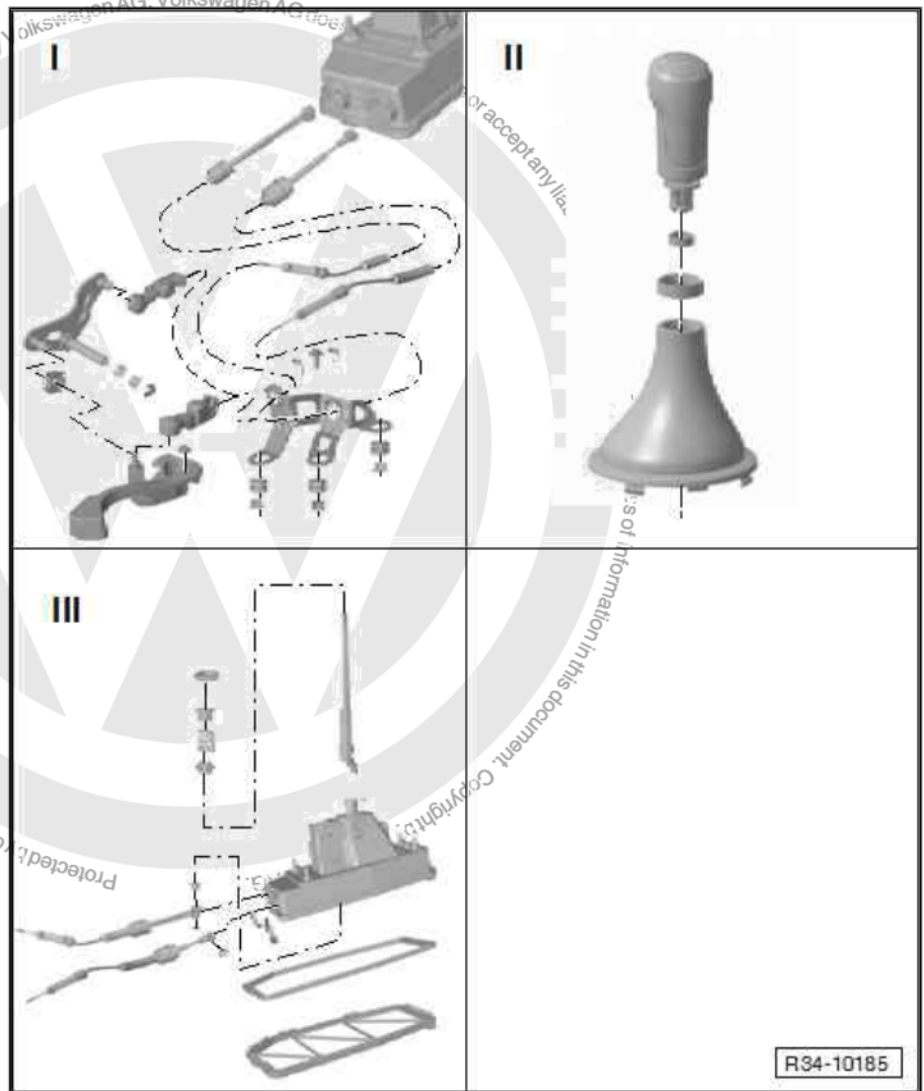
- ☐ Remove and install  
⇒ [page 51](#) .

#### II - Gear lever handle and boot

- ☐ Assembly overview  
⇒ [page 59](#) .
- ☐ Remove and install  
⇒ [page 60](#) .

#### III - Gear lever and mechanism

- ☐ Repair ⇒ [page 66](#) .





## 1.2.2 Selector mechanism - (version 2)

### I - Drive cables

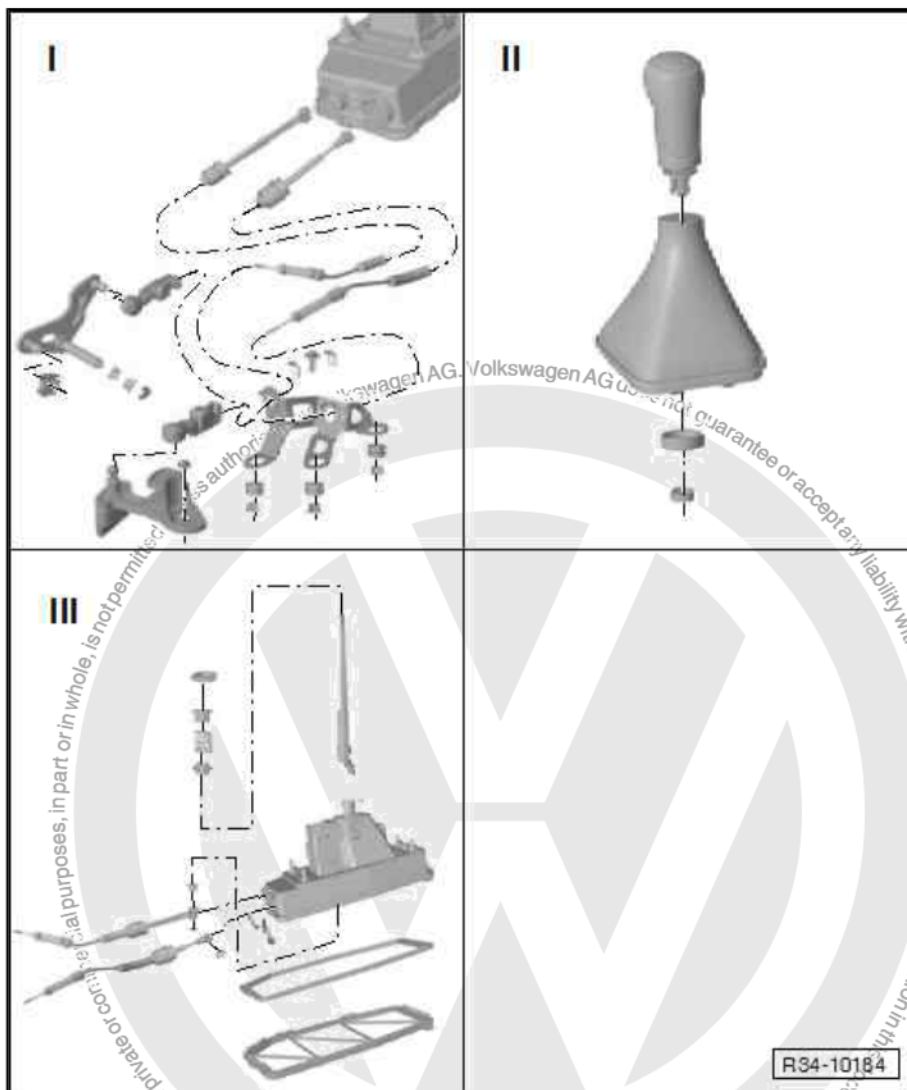
- ❑ Remove and install  
⇒ [page 53](#) .

### II - Gear lever handle and boot

- ❑ Assembly overview  
⇒ [page 60](#) .
- ❑ Remove and install  
⇒ [page 60](#) .

### III - Gear lever and mechanism

- ❑ Repair ⇒ [page 66](#) .





### 1.2.3 Selector mechanism - (version 3)

#### I - Drive cables

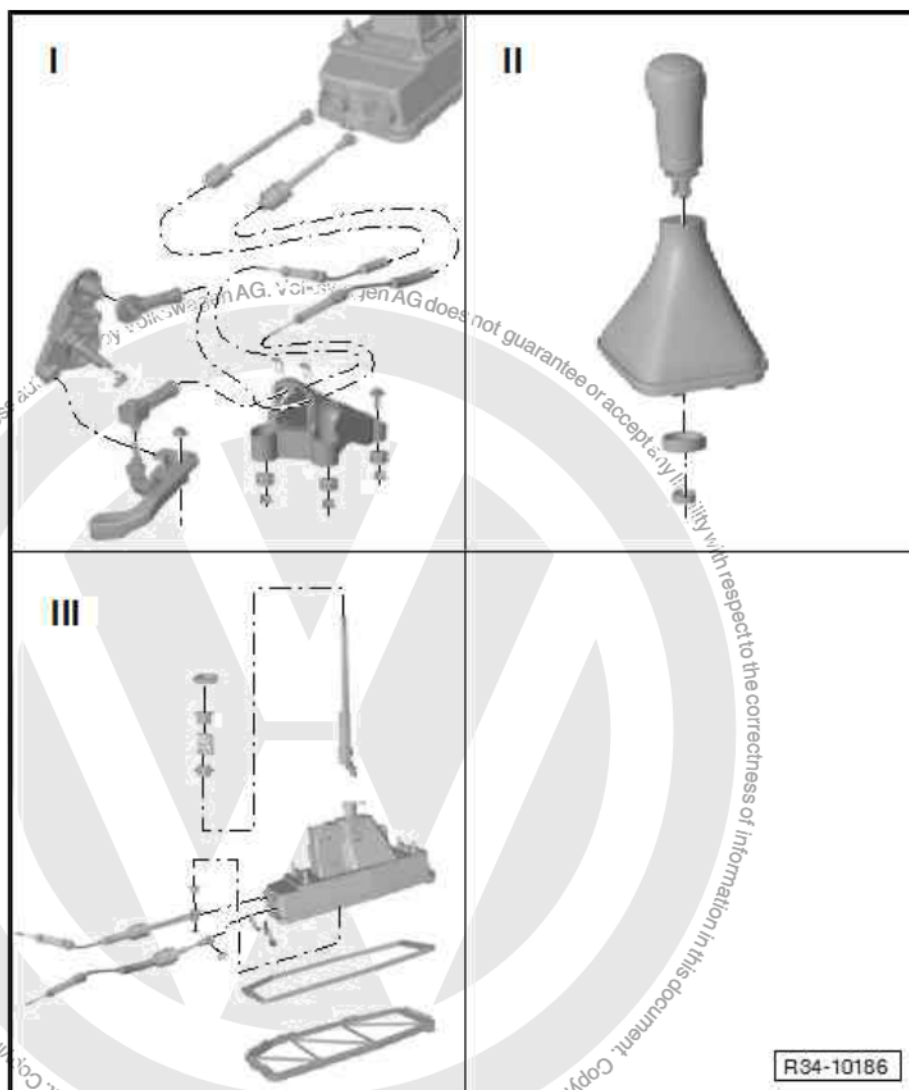
- ☐ Remove and install  
⇒ [page 55](#) .

#### II - Gear lever handle and boot

- ☐ Assembly overview  
⇒ [page 60](#) .
- ☐ Remove and install  
⇒ [page 60](#) .

#### III - Gear lever and mechanism

- ☐ Repair ⇒ [page 66](#) .



### 1.3 Drive cables

⇒ "1.3.1 Drive cables (version 1) - remove and install",  
[page 51](#)

⇒ "1.3.2 Drive cables (version 2) - remove and install",  
[page 53](#)

⇒ "1.3.3 Drive cables (version 3) - remove and install",  
[page 55](#)

#### 1.3.1 Drive cables (version 1) - remove and install



#### WARNING

- ◆ When handling chemicals follow the safety instructions ⇒  
Chemical Products Manual; Rep. gr. 00
- ◆ Assignment of Chemical Materials ⇒ Electronic Parts  
Catalogue "ETKA"





## Note

- ♦ Lubricate supporting points and sliding surfaces.
- ♦ Assignment of Lubrication grease - G 000 450 02- ⇒ *Electronic Parts Catalogue* "ETKA".

### 1 - Gear selector cable

- ☐ Press on the gear lever guide
- ☐ Installation position  
⇒ [page 47](#)
- ☐ For replacement it is necessary to remove the gearshift mechanism case ⇒ [page 62](#)

### 2 - Track selector cable

- ☐ Connected on the command selector
- ☐ Installation position  
⇒ [page 47](#)
- ☐ For replacement it is necessary to remove the gearshift mechanism case ⇒ [page 62](#)

### 3 - Circlip

- ☐ Replace after every removal

### 4 - Circlip

- ☐ Replace after every removal
- ☐ Pay attention to prevent damages on cables during removal

### 5 - Gearshift mechanism case

- ☐ Remove and install  
⇒ [page 62](#)

### 6 - Fastening support

### 7 - Housing bushing

### 8 - Spacer

### 9 - Hexagon socket head bolt

- ☐ 20 ± 2 Nm
- ☐ For fastening support

### 10 - Selector cable fastening

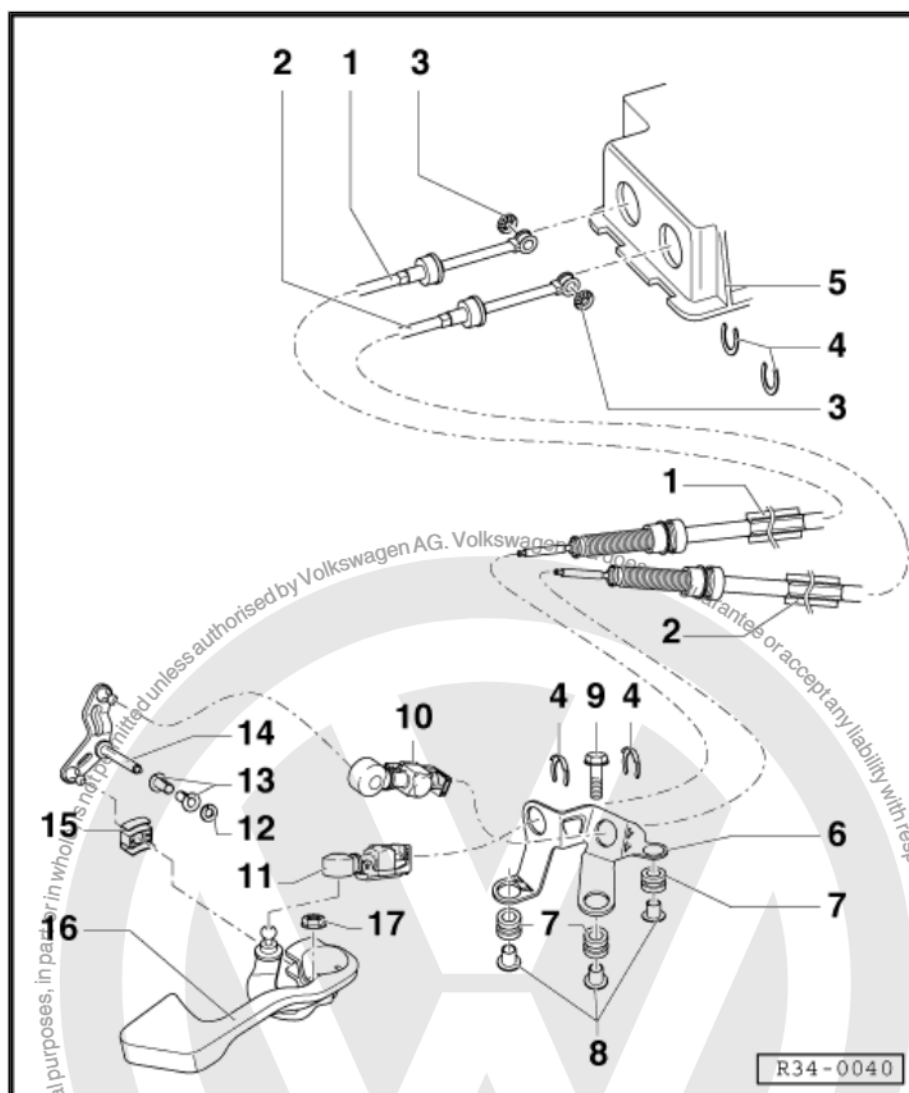
- ☐ To fasten the gear selector cable to the selector lever
- ☐ Replace after every removal from the gearbox selector lever

### 11 - Selector cable fastening

- ☐ To fasten the gear selector cable to the selector lever
- ☐ Replace after every removal from the gearbox selector lever

### 12 - Safety washer

- ☐ Replace after every removal





13 - Bearing bush

14 - Inversion lever

- ❑ Installation position ➔ [page 53](#)

15 - Guide shoe

16 - Gearbox selector lever

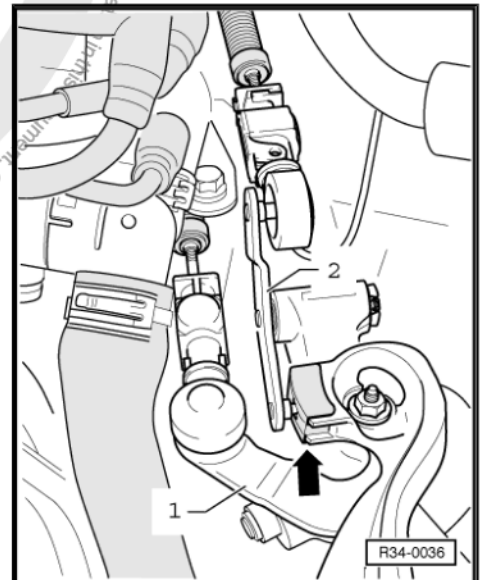
- ❑ With balancing weight
- ❑ Installation position ➔ [page 53](#)
- ❑ Install in order that the interrupted teeth division fits on the selector lever shaft
- ❑ After installation, adjust the gear selection mechanism ➔ [page 68](#)

17 - Hexagonal nut

- ❑ Self-locking
- ❑  $20 \pm 2$  Nm
- ❑ Replace after every removal

Installation position of the selector lever/inversion lever

- 1 - selector lever with balancing weight
- 2 - Inversion lever. Installed on the selector lever guide by a shoe -arrow-.



### 1.3.2 Drive cables (version 2) - remove and install



#### WARNING

- ◆ When handling chemicals follow the safety instructions ➔ *Chemical Products Manual; Rep. gr. 00*
- ◆ Assignment of Chemical Materials ➔ *Electronic Parts Catalogue "ETKA"*



#### Note

- ◆ Lubricate supporting points and sliding surfaces.
- ◆ Assignment of Lubrication grease - G 000 450 02- ➔ *Electronic Parts Catalogue "ETKA"*.



1 - Gear selector cable

- ☐ Press on the gear lever guide
- ☐ Installation position ➤ [page 47](#)
- ☐ For replacement it is necessary to remove the gearshift mechanism case ➤ [page 62](#)

2 - Track selector cable

- ☐ Connected on the command selector
- ☐ Installation position ➤ [page 47](#)
- ☐ For replacement it is necessary to remove the gearshift mechanism case ➤ [page 62](#)

3 - Circlip

- ☐ Replace after every removal

4 - Circlip

- ☐ Replace after every removal
- ☐ Pay attention to prevent damages on cables during removal

5 - Gearshift mechanism case

- ☐ Remove and install ➤ [page 62](#)

6 - Fastening support

7 - Housing bushing

8 - Spacer

9 - Hexagon socket head bolt

- ☐  $20 \pm 2$  Nm
- ☐ For fastening support

10 - Selector cable fastening

- ☐ To fasten the gear selector cable to the selector lever
- ☐ Replace after every removal from the gearbox selector lever

11 - Selector cable fastening

- ☐ To fasten the gear selector cable to the selector lever
- ☐ Replace after every removal from the gearbox selector lever

12 - Safety washer

- ☐ Replace after every removal

13 - Bearing bush

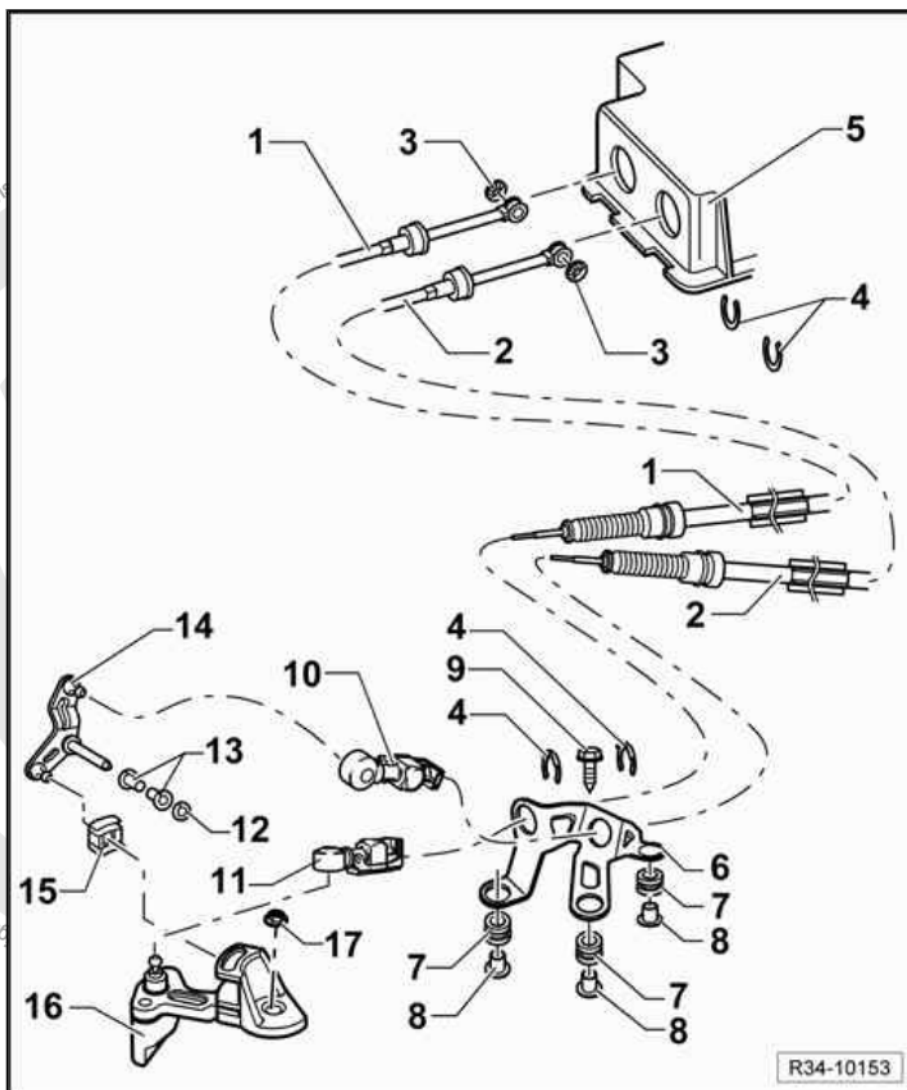
14 - Inversion lever

- ☐ Installation position ➤ [page 55](#) .

15 - Guide shoe

16 - Gearbox selector lever

- ☐ With balancing weight
- ☐ Installation position ➤ [page 55](#)





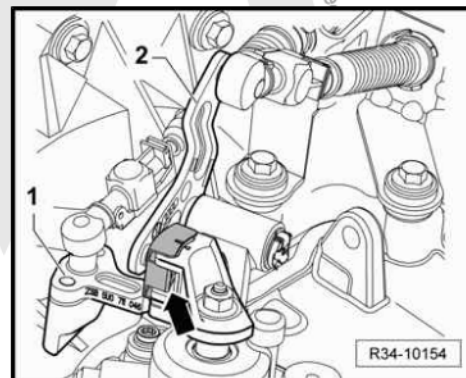
- ☐ Install in order that the interrupted teeth division fits on the selector lever shaft
- ☐ After installation, adjust the gear selection mechanism ⇒ [page 68](#)

#### 17 - Hexagonal nut

- ☐ Self-locking
- ☐  $20 \pm 2$  Nm
- ☐ Replace after every removal

#### Installation position of the selector lever/inversion lever

- 1 - selector lever with balancing weight
- 2 - Inversion lever. Installed on the selector lever guide by a shoe -arrow-.



### 1.3.3 Drive cables (version 3) - remove and install



#### WARNING

- ◆ *When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00*
- ◆ *Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"*



#### Note

- ◆ *Lubricate supporting points and sliding surfaces.*
- ◆ *Assignment of Lubrication grease - G 000 450 02- ⇒ Electronic Parts Catalogue "ETKA".*





1 - Gear selector cable

- ☐ Press on the gear lever guide
- ☐ Installation position  
⇒ [page 47](#)
- ☐ For replacement it is necessary to remove the gearshift mechanism case ⇒ [page 62](#)

2 - Track selector cable

- ☐ Connected on the command selector
- ☐ Installation position  
⇒ [page 47](#)
- ☐ For replacement it is necessary to remove the gearshift mechanism case ⇒ [page 62](#)

3 - Bushing

4 - Circlips

- ☐ Replace after every removal
- ☐ Pay attention to prevent damages on cables during removal.

5 - Gearshift mechanism case

- ☐ Remove and install  
⇒ [page 62](#)

6 - Fastening support

- ☐ Different versions ⇒  
Electronic Parts  
Catalogue“ETKA”

7 - Housing bushing

8 - Spacer

9 - Hexagon socket head bolt

- ☐  $20 \pm 2$  Nm
- ☐ For fastening of the fastening support to the transmission

10 - Selector cable fastening

- ☐ Location ⇒ [page 57](#)
- ☐ Different versions ⇒ Electronic Parts Catalogue“ETKA”
- ☐ To fasten the gear selector cable to the selector lever

11 - Safety washer

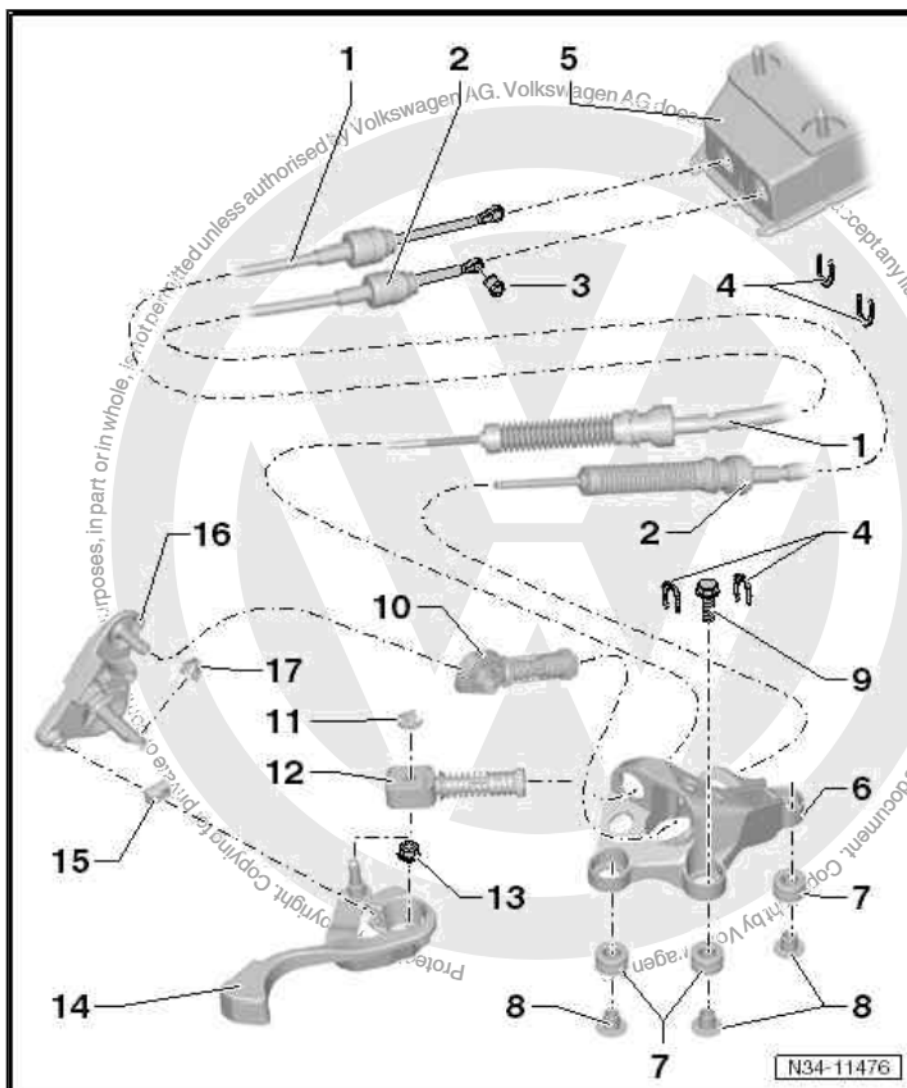
- ☐ Replace after every removal

12 - Selector cable fastening

- ☐ Location ⇒ [page 57](#)
- ☐ Different versions ⇒ Electronic Parts Catalogue“ETKA”
- ☐ To fasten the gear selector cable to the selector lever

13 - Hexagonal nut

- ☐ Self-locking
- ☐  $20 \pm 2$  Nm
- ☐ Replace after every removal





#### 14 - Gearbox selector lever

- ☐ Different versions ⇒ Electronic Parts Catalogue "ETKA"
- ☐ With balancing weight
- ☐ Installation position ⇒ [page 47](#)
- ☐ Install in order that the interrupted teeth division fits on the selector lever shaft
- ☐ After installation, adjust the gear selection mechanism ⇒ [page 68](#)

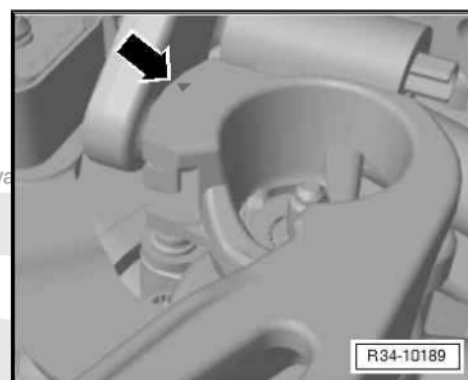
#### 15 - Shoe

#### 16 - Inversion lever

- ☐ Installation position ⇒ [page 57](#) .

#### 17 - Plastic lock

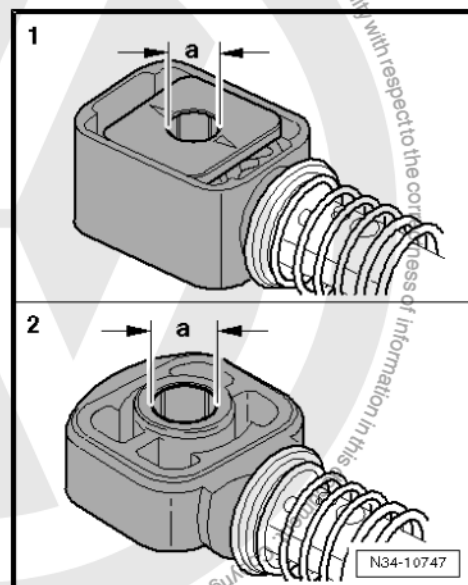
Installation position of the selector lever/inversion lever



#### Selector cable fastening

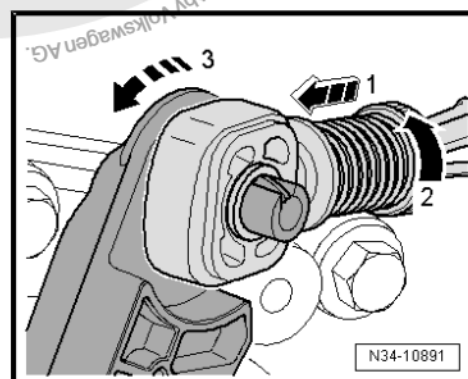
Assignment: ⇒ Electronic Parts Catalog "ETKA"

Locking of cable for:	Dimension "a"
1.- Shift cable to shift lever (locking of shift cable with high box)	8.5 mm
2.- Shift cable to shift lever (locking of shift cable with flat box)	10 mm
2.- Selector cable to metal inversion lever	8 mm
2.- Selector cable to plastic inversion lever	10 mm



#### Removal of selector cable from its fastening

- Press the mechanism forward, up to the buffer  
-in direction of arrow 1- and then remove it by turning it to the left -in direction of arrow 2-.
- Then press the lever forward -in direction of arrow 3-.





### Inversion lever with clip

#### Removal:

- To remove the inversion lever, it is necessary to remove the selector cable from its fastening ➔ [page 57](#) .



#### Note

*By doing so, it is possible to avoid damage to the selector cable*

- Remove the clip -arrow 1- and remove the inversion lever along with the fastening of the selector cable.

The fastening of the selector cable must be installed -arrow 2-.

#### Continuation:

- Remove the fastening of the selector cable only with the inversion lever removed ➔ [page 58](#)

#### Installation:

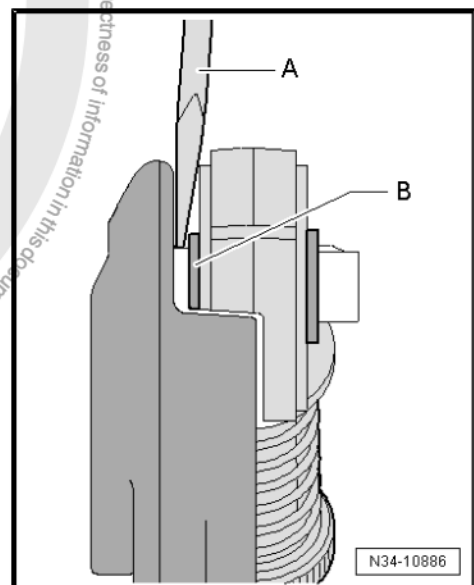


#### Note

- ♦ Lubricate supporting points and sliding surfaces.
- ♦ Assignment of the Lubrication grease - G 000 450 02- ➔ *Electronic Parts Catalogue "ETKA"* .
- Fit via pressure the fastening of the selector cable on the inversion lever ➔ [page 59](#) .
- Insert the inversion lever up to the buffer, along with the fastening of the selector cable.
- The lock -arrow 1- arrests the inverter lever (➔ previous figure).
- Ensure a safe fit.
- The fastener of the selector cable must be installed -arrow 2- (➔ previous figure).

#### Removal of the fastening of the selector cable on the inversion lever

- The inversion lever must be removed
- Insert a screwdriver -A- between the bushing -B- and the inversion cable.

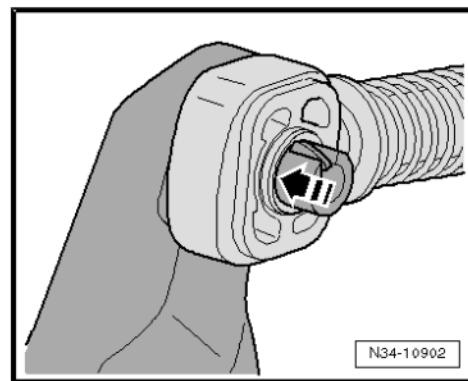






Installation of the fastening of the selector cable on the inversion lever

- The inversion lever must be removed
- Press the fastening of the cable, only via the bushing -arrow-.
- The fastening of the selector cable must have mobility on the inversion lever.



## 1.4 Handle and boot on the gear lever - assembly overview

⇒ ["1.4.1 Handle and boot on the gear lever \(version 1\) - assembly overview", page 59](#)

⇒ ["1.4.2 Handle and boot on the gear lever \(version 2\) - assembly overview", page 60](#)

### 1.4.1 Handle and boot on the gear lever (version 1) - assembly overview

#### 1 - Gear knob

- ☐ Remove and install  
⇒ [page 60](#)
- ☐ Remove and install with boot

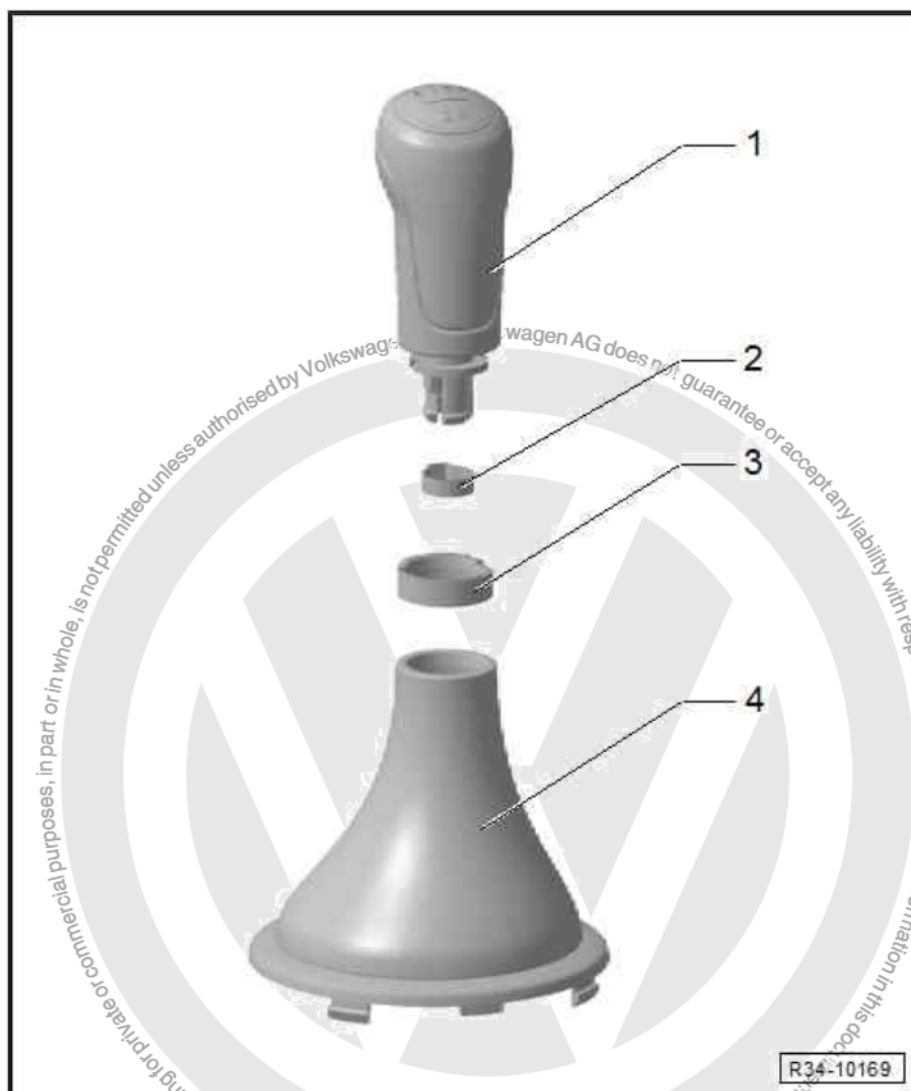
#### 2 - Clamp

- ☐ To fasten handle to gear lever
- ☐ Replace after every removal
- ☐ Fasten with Clamp pliers or VW 004V - VAG 1275- to gear knob

#### 3 - Bushing

#### 4 - boot with frame

- ☐ Remove and install with the gear knob.





## 1.4.2 Handle and boot on the gear lever (version 2) - assembly overview

### 1 - Gear knob

- ☐ Remove and install  
⇒ [page 60](#)
- ☐ Remove and install with  
boot

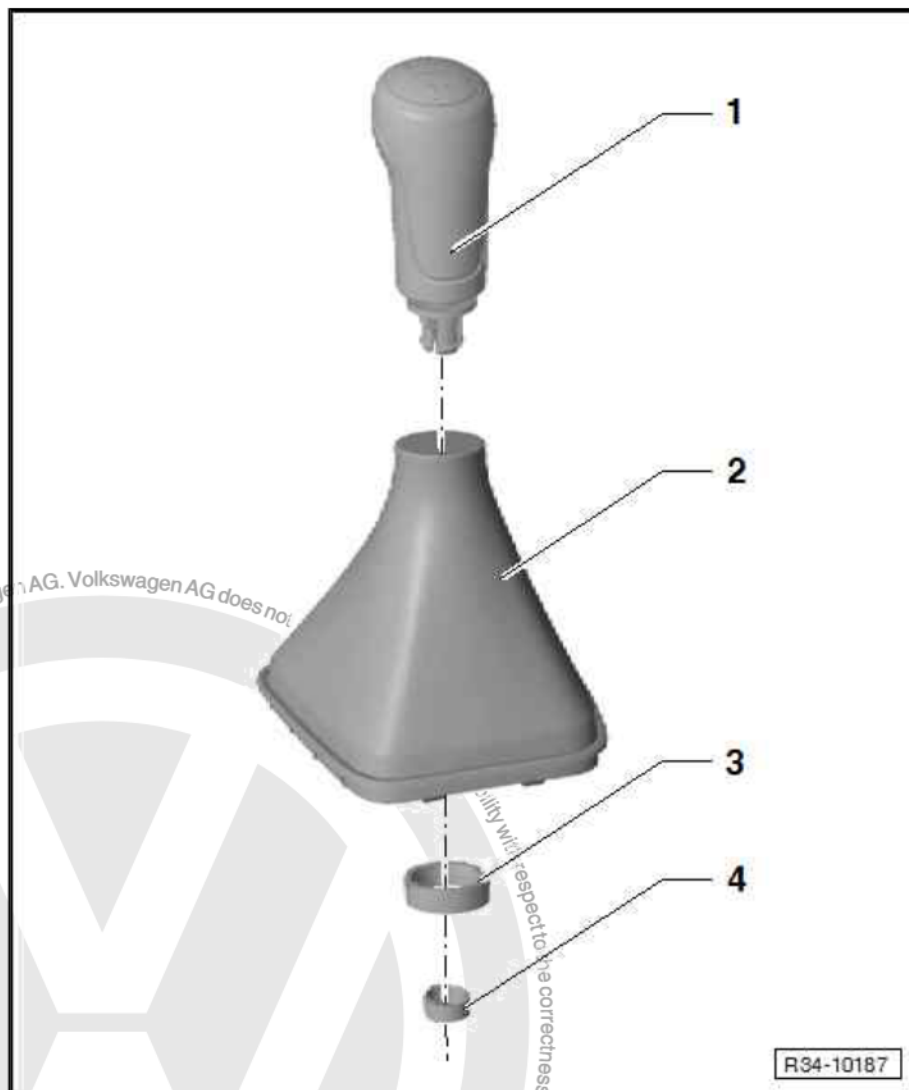
### 2 - boot with frame

- ☐ Remove and install with  
the gear lever handle
- ☐ Disassemble gear lever  
handle, by removing the  
bushing ⇒ [page 61](#)

### 3 - Bushing

### 4 - Clamp

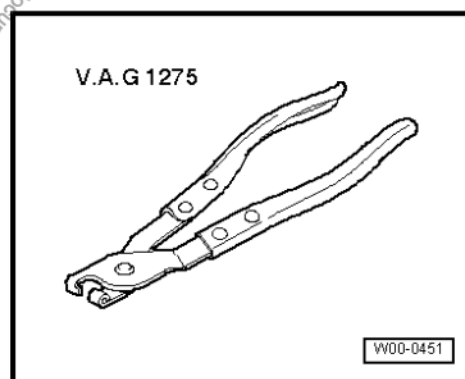
- ☐ To fasten handle to gear  
lever
- ☐ Replace after every re-  
moval
- ☐ Fasten with Clamp pliers or VW 004V - VAG  
1275- to gear knob



## 1.5 Handle and boot on the gear lever - remove and install

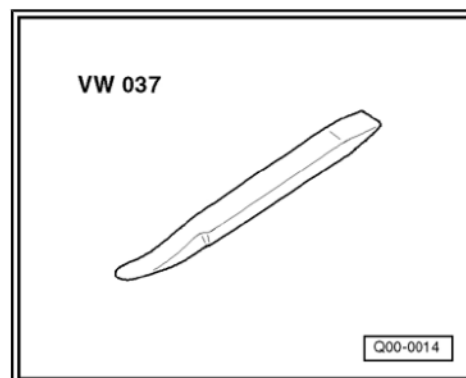
Special tools and workshop equipment required

- ◆ Clamp pliers or VW 004V - VAG 1275-



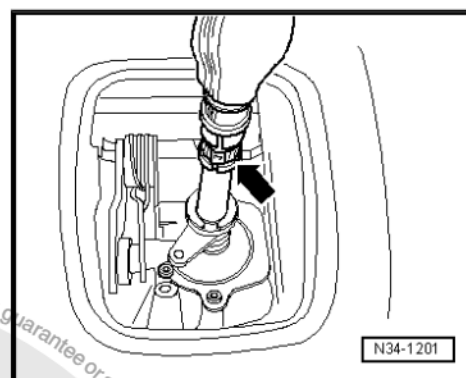


◆ Spatula - VW 037-



### 1.5.1 Removal

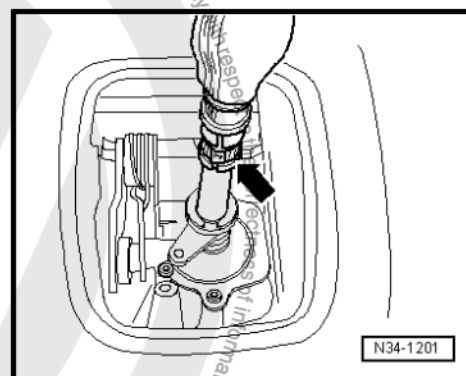
- Carefully disengage boot from centre console using the scraper - VW 037- .
- Turn boot backwards on top of gear knob.
- Remove trim, if any.
- Remove clamp -arrow- and remove gear lever handle along with boot.



### 1.5.2 Installation

- Turn boot lower section outwards.
- Assemble gear lever handle and boot and put a new clamp -arrow-.

When assembling, handle must fit the gear lever groove.



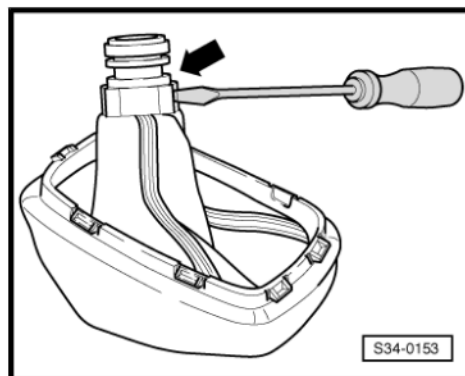
## 1.6 Handle and boot on the gear lever - disassemble and assemble

### 1.6.1 Disassembly

- Turn cover internal side outwards.

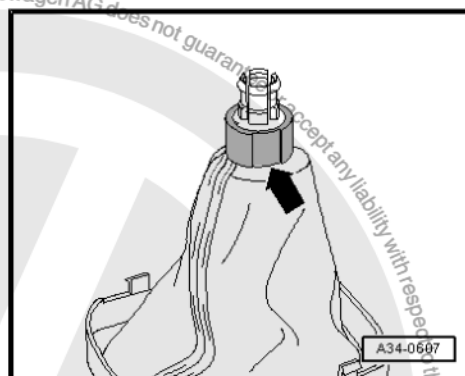


- With a screwdriver, carefully force tightening bushing -arrow- and simultaneously pull gear lever handle out.



#### Note

For some components, screwdriver must be used between packing and bushing where indicated by the -arrow-.



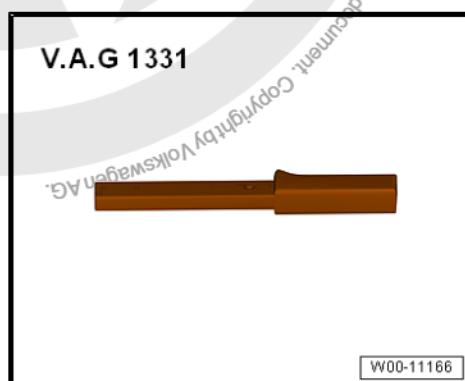
### 1.6.2 Assembly

- Install gear lever handle on boot.
- Press tightening bushing on handle and fit.

### 1.7 Gear shift lever and shifting mechanism - remove and install

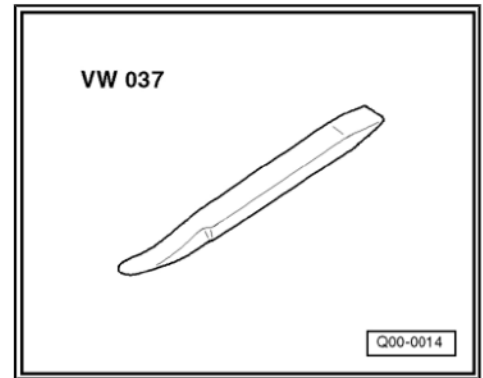
Special tools and workshop equipment required

- ♦ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-





◆ Spatula - VW 037-



### 1.7.1 Removal

- Disconnect and remove the Battery - A- ➔ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .



**Note**

- ◆ *Check whether the vehicle has a coded radio. If so, solicit the anti-theft code before disconnecting the Battery - A- .*
- ◆ *When the Battery - A- ground wire is reconnected, check vehicle equipment (radio, clock, central locking, electric windows, etc.) according to the repair manual and/or instructions for use.*

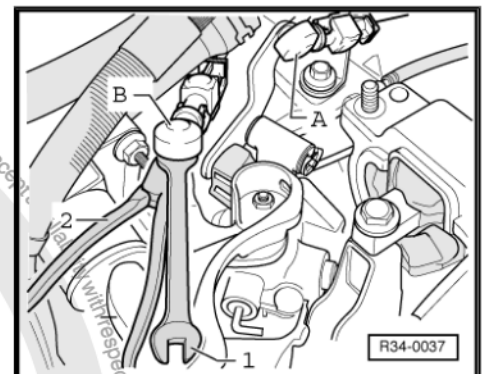
- Remove the console from the Battery - A- ➔ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .

Continuation to the inversion lever "metal":

- The fastening elements -A- or -B- must be disengaged by using a spanner -1-, only to replace the gear selection cable, track selector cable or fastening element.

1 - 13 mm spanner

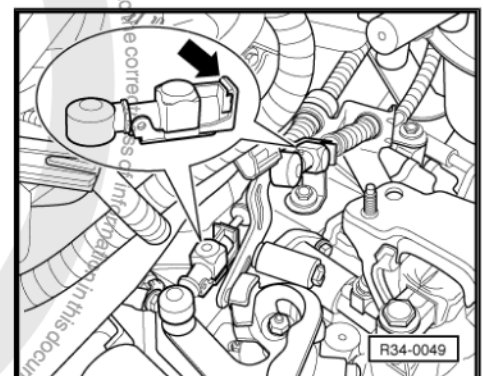
- Install a second open-mouth wrench or suitable pliers -2- below.



**Note**

*If it is not necessary to replace the mentioned components, it is necessary to loosen the fasteners by unlocking their respective locks -arrow-.*

Continuation to the inversion lever "plastic":

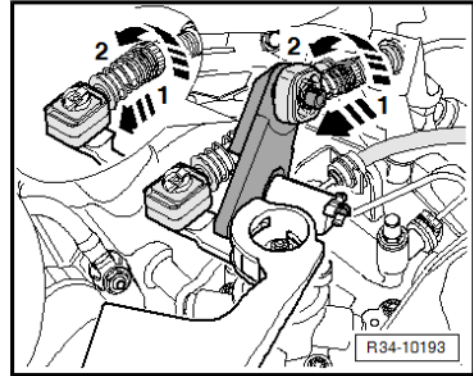




- Press the mechanisms forward, up to the buffer  
-in direction of arrow 1- and then remove it by turning it to the left -in direction of arrow 2-.
- Then remove the cables from the fastening elements.

Continuation for:

Vehicles with fastening support of the gearbox cable “metal”:



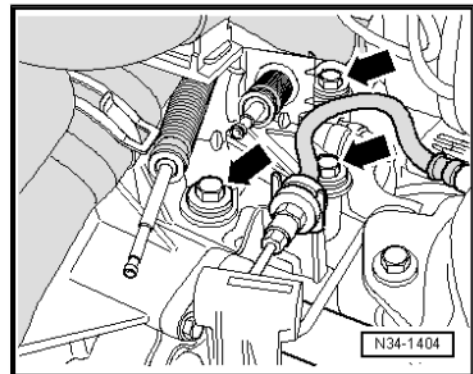
- Loosen fastening screws -arrows- and remove the gearbox cable fastening support.



Note

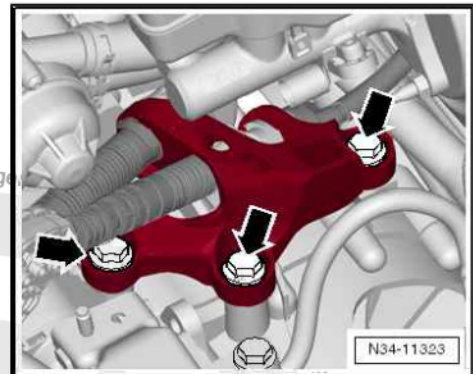
*For better comprehension, the selector lever, inversion lever and cable fastening elements are not represented.*

Vehicles with fastening support of the gearbox cable “metal”:

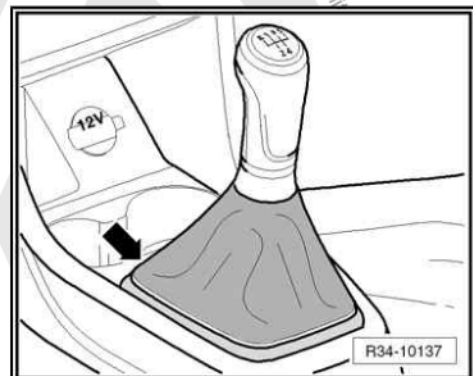


- Loosen fastening screws -arrows- and remove the gearbox cable fastening support.

Continuation:



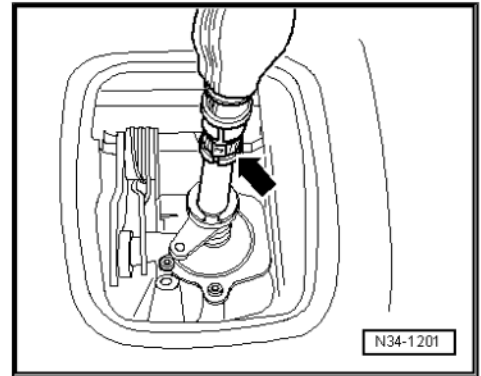
- Remove carefully the boot on the central console. To facilitate the operation, use the Scraper - VW 037- with care.



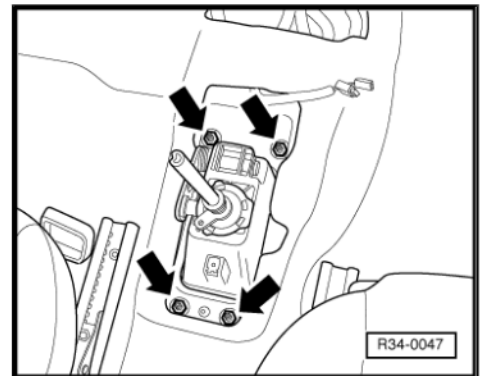




- Loosen clamp -arrow- and pull gear lever handle out along with boot.
- Remove the centre console ⇒ Body - Internal assembly work; Rep. gr. 68 ; Internal equipment .



- Remove fastening nuts -arrows- from the gearshift mechanism housing case.
- Remove the engine compartment lower noise insulation, if any ⇒ General body repairs, exteriors; Rep. gr. 50 ; Body - Front section .
- Remove cross member under the exhaust system.
- Separate the front exhaust pipe from the rear exhaust pipe, by loosening the double clamp and the sustaining strap of the intermediate silencer ⇒ Engine; Rep. gr. 26 ; Exhaust system .



#### Note

*Fastening nuts and screws of the front exhaust pipe near the exhaust tube, near the catalyst converter*

- Remove heat shield.
- Remove the gearshift mechanism case downwards together with the drive cables.

### 1.7.2 Installation



#### WARNING

- ◆ *When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00*
- ◆ *Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"*

Installation is performed in reverse to removal sequence, considering the following:



Continuation to the inversion lever "metal":

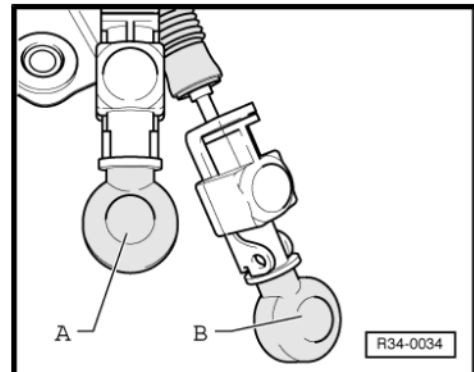
If the fastening elements of the cables have been removed, they must be replaced.

- Apply a light coat of lubricating grease on the housings of the new fastening elements -A- and -B-.



Note

- ◆ Assignment of the Lubrication grease - G 000 450 02- ⇒ Electronic Parts Catalogue "ETKA".
- ◆ The external sealing lips -arrows- should be free of grease.



- Press the gate selector cable on the selector lever, and the track selector cable on the inversion lever -arrows-.

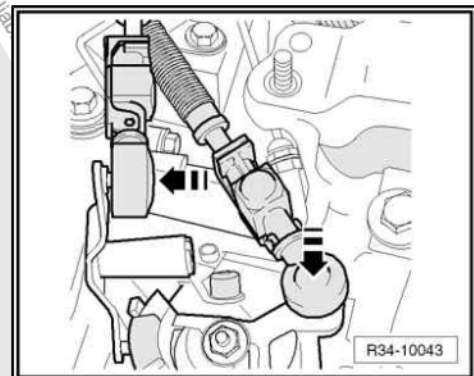
If the selector cable fastening has not been removed:

Connect the gear selector cable and the command selector cable with respective fixtures.

Adjust the gearshift mechanism ⇒ [page 68](#) .

Continuation to the inversion lever "plastic":

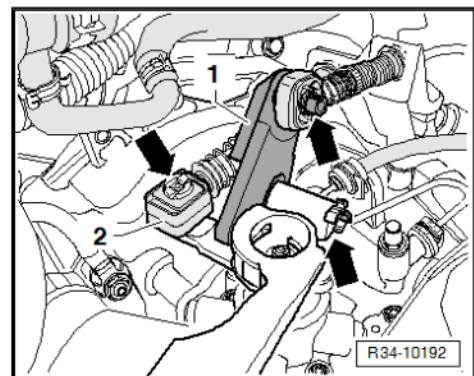
The securing elements have different Ø holes. See placing ⇒ [page 57](#)



Note

Assignment of the Lubrication grease - G 000 450 02- ⇒ Electronic Parts Catalogue "ETKA".

- Apply a light coat of lubrication grease on the housings -arrows- of the fastening elements -1- and -2- and on the sliding surfaces.
- Install the new metallic lock -arrow- of the fastening element -2-.
- Connect the gear selector cable and the command selector cable with respective fixtures.
- Adjust the gear selection mechanism ⇒ [page 68](#) .



## 1.8 Gearshift lever and mechanism - repair



### WARNING

- ◆ When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00
- ◆ Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"



## Note

- ◆ Lubricate supporting points and sliding surfaces.
- ◆ Assignment of Lubrication grease - G 000 450 02- ⇒ Electronic Parts Catalogue "ETKA".

- 1 - Gasket
  - ☐ Self-adhesive
  - ☐ Install on the gearshift mechanism case

- 2 - Gear lever
  - ☐ Assignment: ⇒ Electronic Parts Catalog "ETKA"

- 3 - Gearshift mechanism case
  - ☐ Remove and install ⇒ [page 62](#)

- 4 - Bearing plate
  - ☐ To remove, open locks
  - ☐ Replace after every removal
  - ☐ At assemble, apply  $12 \pm 2$  g. Sealing compound - D 176 404 A2- .
  - ☐ Assignment: ⇒ Electronic Parts Catalogue "ETKA".

- 5 - Circlips
  - ☐ Replace after each removal.

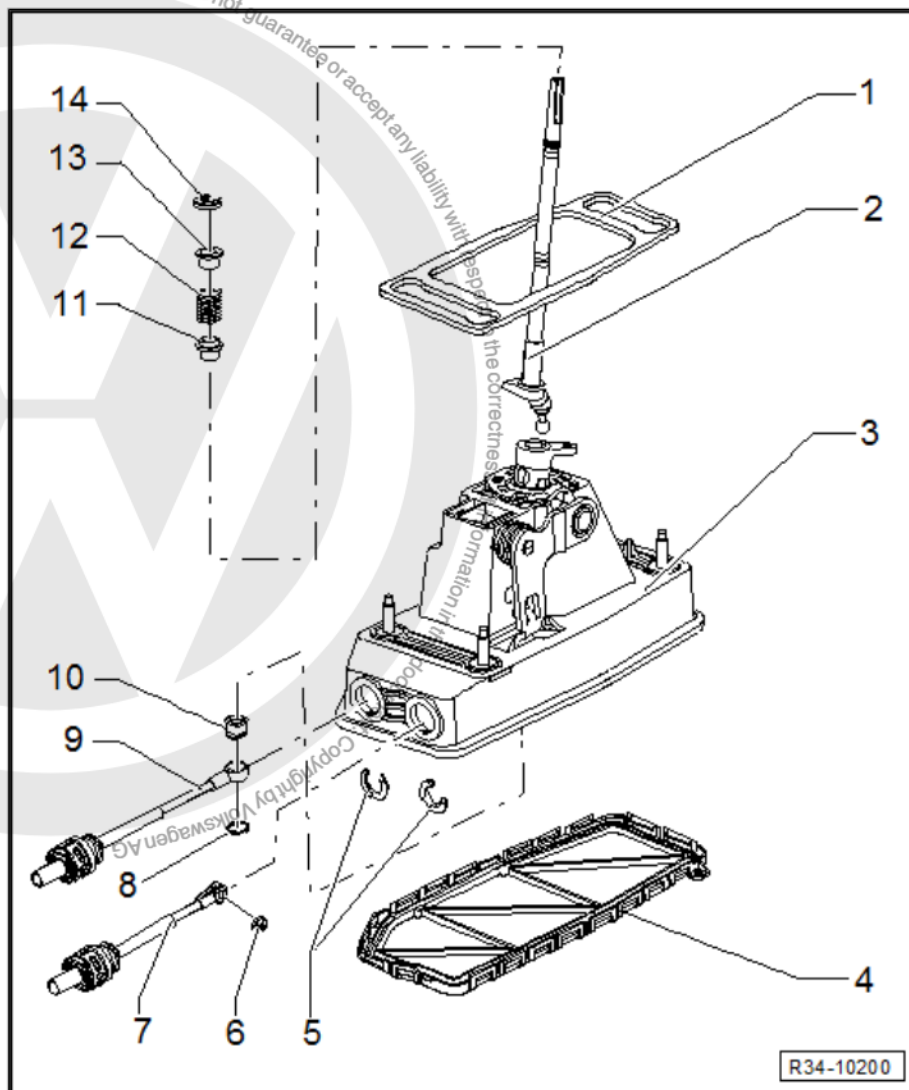
- 6 - Circlip
  - ☐ Replace after every removal

- 7 - Track selector cable
  - ☐ Installation position ⇒ [page 47](#)
  - ☐ For replacement it is necessary to remove the gearshift mechanism case ⇒ [page 62](#)

- 8 - Circlip
  - ☐ Replace after every removal

- 9 - Gear selector cable
  - ☐ Installation position ⇒ [page 47](#)
  - ☐ For replacement it is necessary to remove the gearshift mechanism case ⇒ [page 62](#)

- 10 - Bushing
  - ☐ Replace after every removal



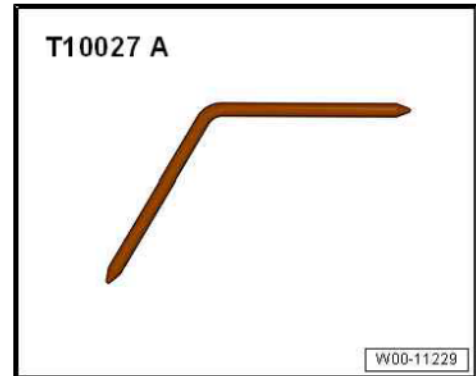


- 11 - Lower bushing
- 12 - Spring
- 13 - Upper bushing
- 14 - Circlip

## 1.9 Lever and Gear shifting mechanism - adjusting

Special tools and workshop equipment required

- ◆ Key - T10027A-



Check conditions:

- gearbox in "dead centre".
- Gear lever and cables in perfect conditions.
- Good operation when engaging gears.
- Gearbox, clutch and drive mechanism in perfect conditions.

Unlock the fastening elements of the drive cables:

- Release the fastening elements by unlocking their respective locks -arrow-.



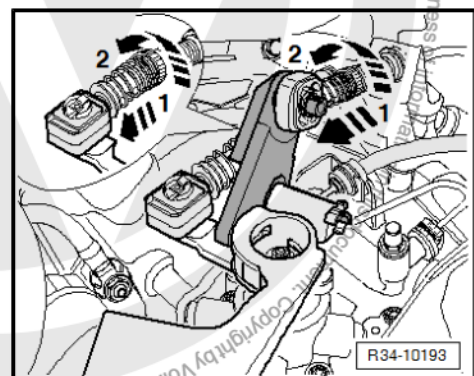
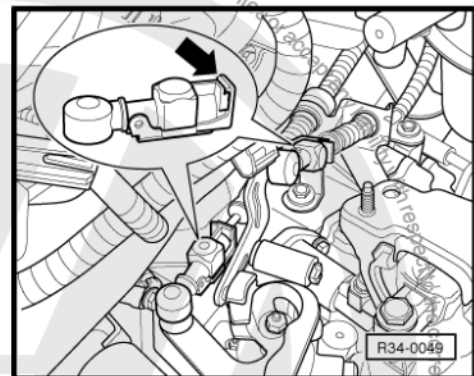
Note

*Selector cable must move on the cable fastening element.*

or depending on the type of fastener:

- Remove fasteners by removing them from cables in direction of -arrow 1- until buffer and lock them by turning left in direction of -arrow 2-.

Lock selector lever:



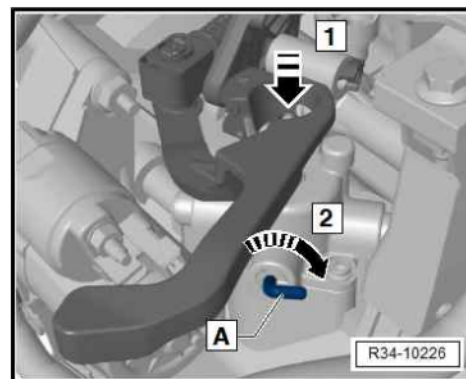




- Press selector lever downwards towards -arrow 1- in 1st and 2nd gear, and turn the safety pin -A- by approximately 90° towards -arrow 2-.

Lock gear lever:

- Remove the gear lever boot from centre console.

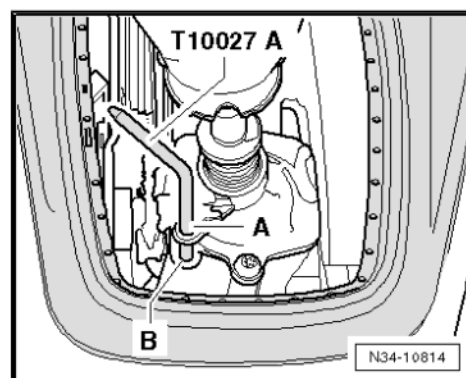


- Move slowly the gear lever to left in the 1st and 2nd-gear track.
- Introduce Key - T10027A- in hole -B- through hole -A-.



Note

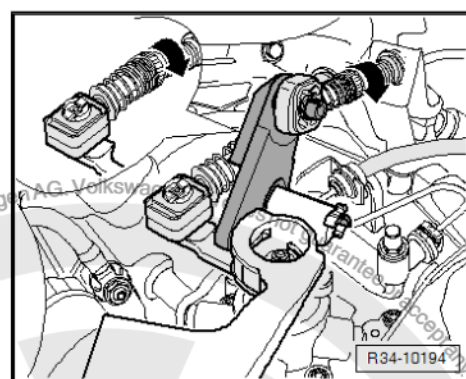
*Check that the selector lever command and the selector cable are mounted without tension on the cable fastening element.*



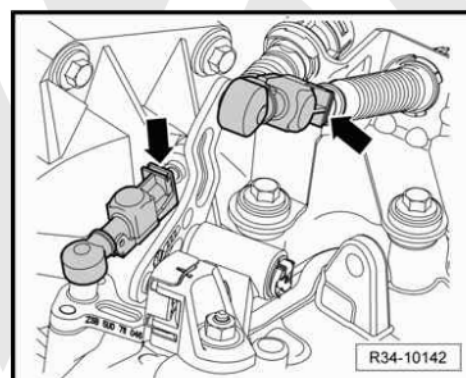
- Turn to right, to the stop, the gate selector cables' safety mechanism, towards -arrow-.

The spring returns the safety mechanism to initial position.

or depending on the type of fastener:

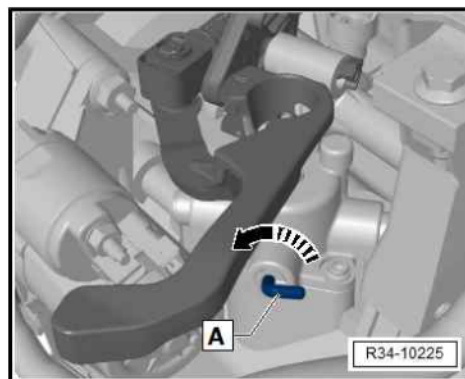


- Move the gate selector cables' safety mechanism until locking them -arrow-.

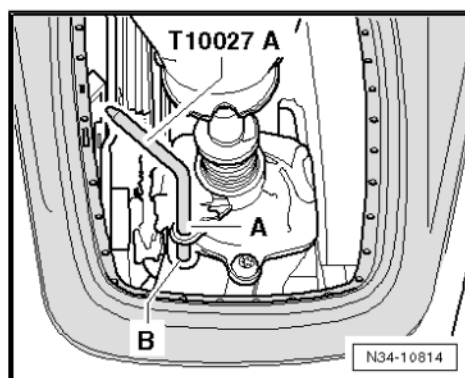




- Turn safety pin -A- towards -arrow-, in order to return to its initial position.
- The safety pin -A- should remain in a vertical position.



- Remove Key - T10027A- from holes -A- and -B-.
- Install the removed components.

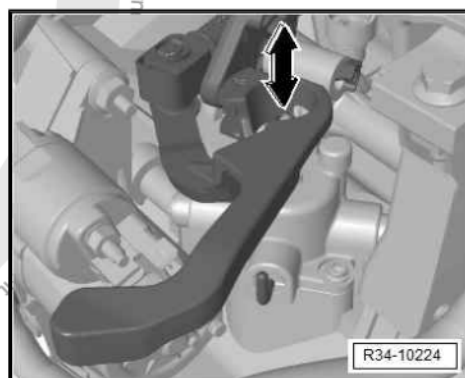


## 1.10 Selector and lever - functional check

- Gear lever should be in the “dead centre position”, in 3rd/4th gear track.
- Activate clutch.
- Engage all gears several times. Make sure especially that the reverse gear blocking is operating correctly.

When a gear is engaged repetitively and a problem still persists, check clearance (travel) of the selector lever, as follows:

- Place the car in first gear.
- Move gear lever to the left, to the stop, and release it.
- At same time, check the transmission selector lever (2nd mechanic).
- When moving the gear lever, the selector lever should have a travel of approximately 1 mm -arrow-.

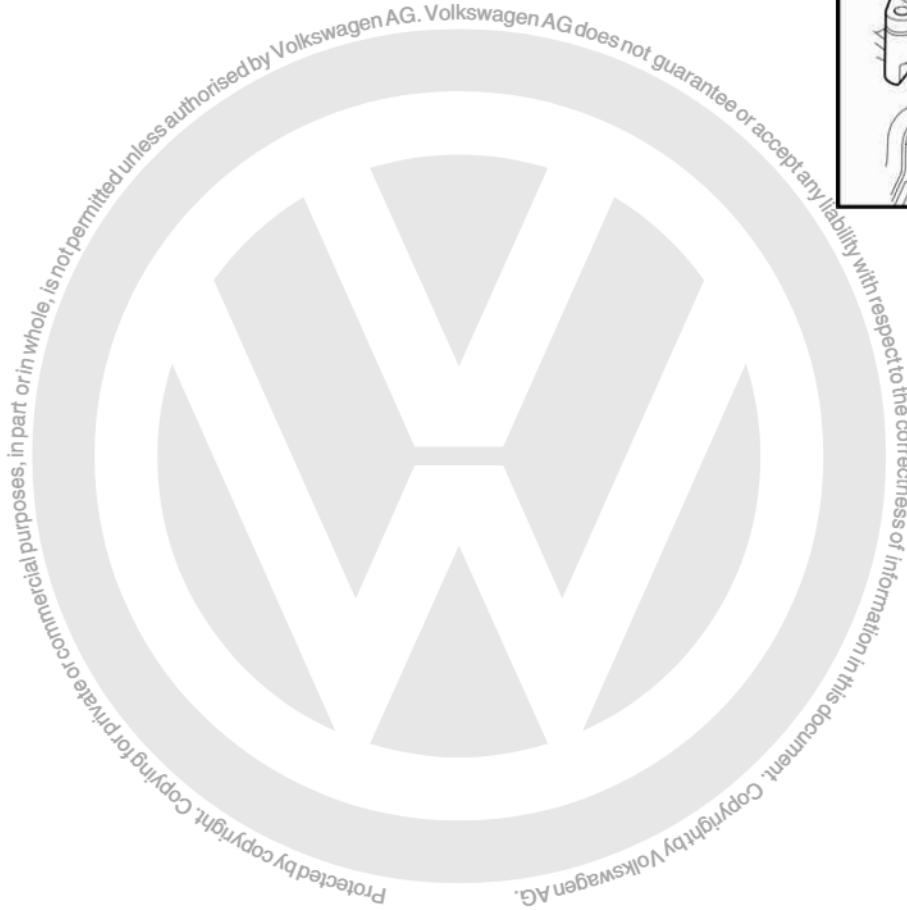
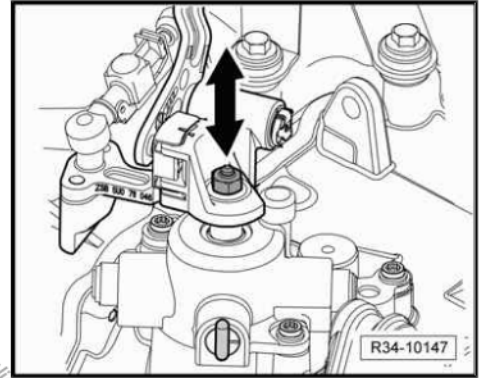






or

- Otherwise, readjust the gear selection lever mechanism  
⇒ [page 68](#) .





## 2 Transmission - remove and install

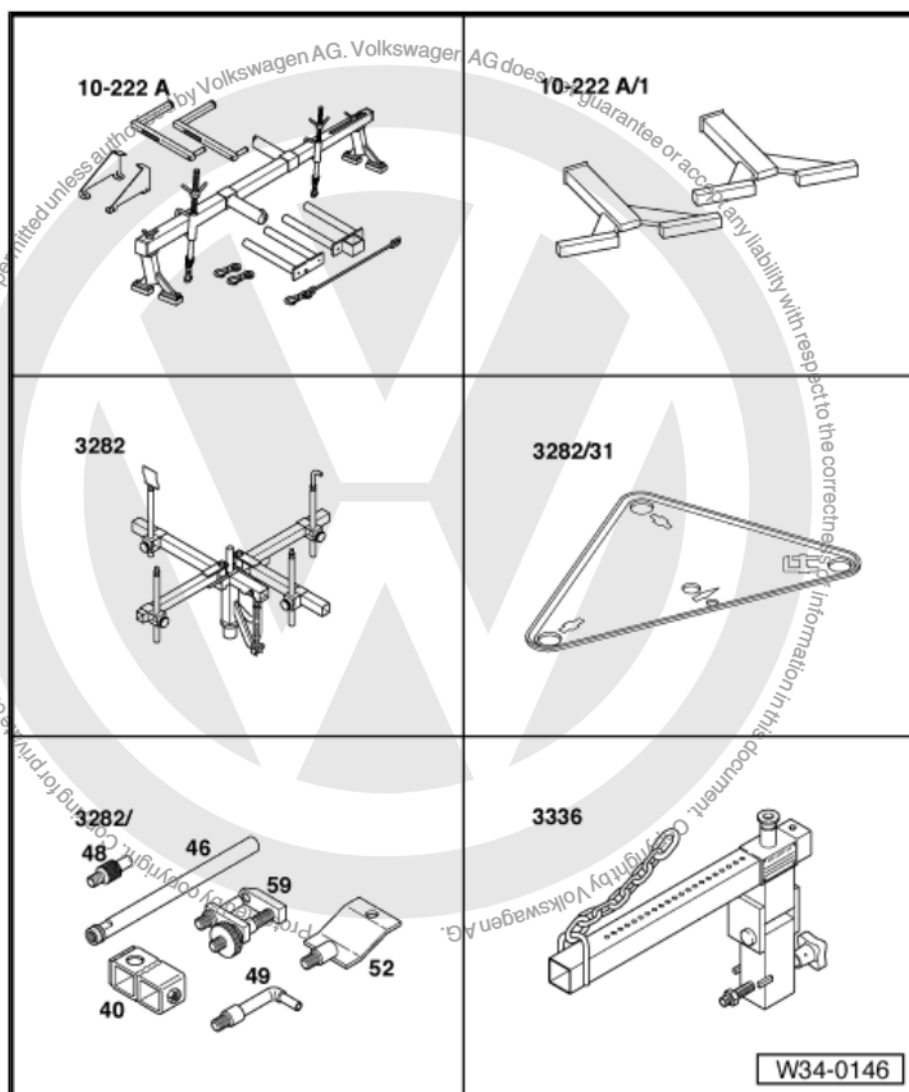
⇒ "2.1 Gearbox for vehicles with engines (AQZ, ASY, BAH, BJA, BJE, BKR, BLH, BMD, BNM, BNX, BPA, CCNA, CCRA, CFZA, CHFA, CHFB, CPBA) - remove and install", page 72

⇒ "2.2 Gearbox for vehicles with engines (CSEA) - remove and install", page 90

⇒ "2.3 Gearbox - transport", page 102

### 2.1 Gearbox for vehicles with engines (AQZ, ASY, BAH, BJA, BJE, BKR, BLH, BMD, BNM, BNX, BPA, CCNA, CCRA, CFZA, CHFA, CHFB, CPBA) - remove and install



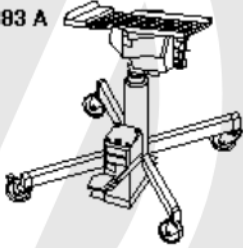
Special tools and workshop equipment required



- ◆ Support or VW 061 - 10-222A-
- ◆ Support - 10-222 A/1-
- ◆ Mounting bracket - 3282-
- ◆ Adjustment plate - 3282/31-
- ◆ Pin - 3282/48-
- ◆ Mounting bracket - 3282/59-



◆ Mounting bracket - 3336-

<p><b>V.A.G 1331</b></p> 	<p><b>V.A.G 1332</b></p> 
<p><b>V.A.G 1383 A</b></p> 	
	<p>W34-0092</p>

- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-
- ◆ Torque Wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A-

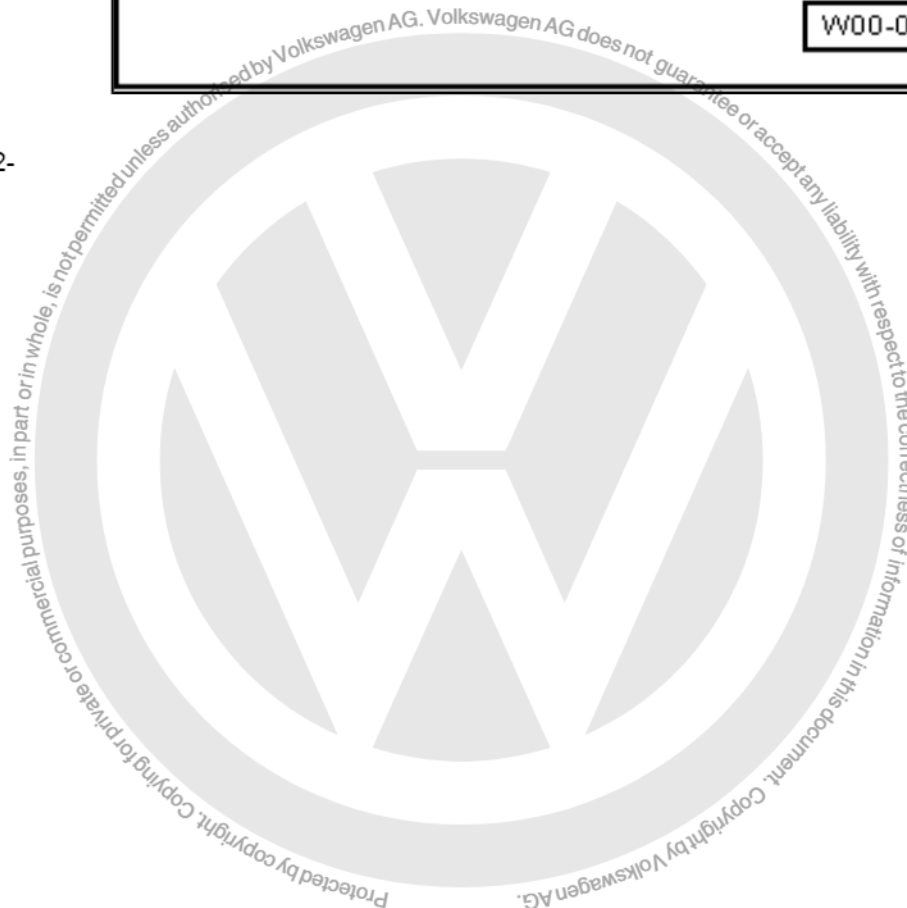


10-222 A/2



W00-0472

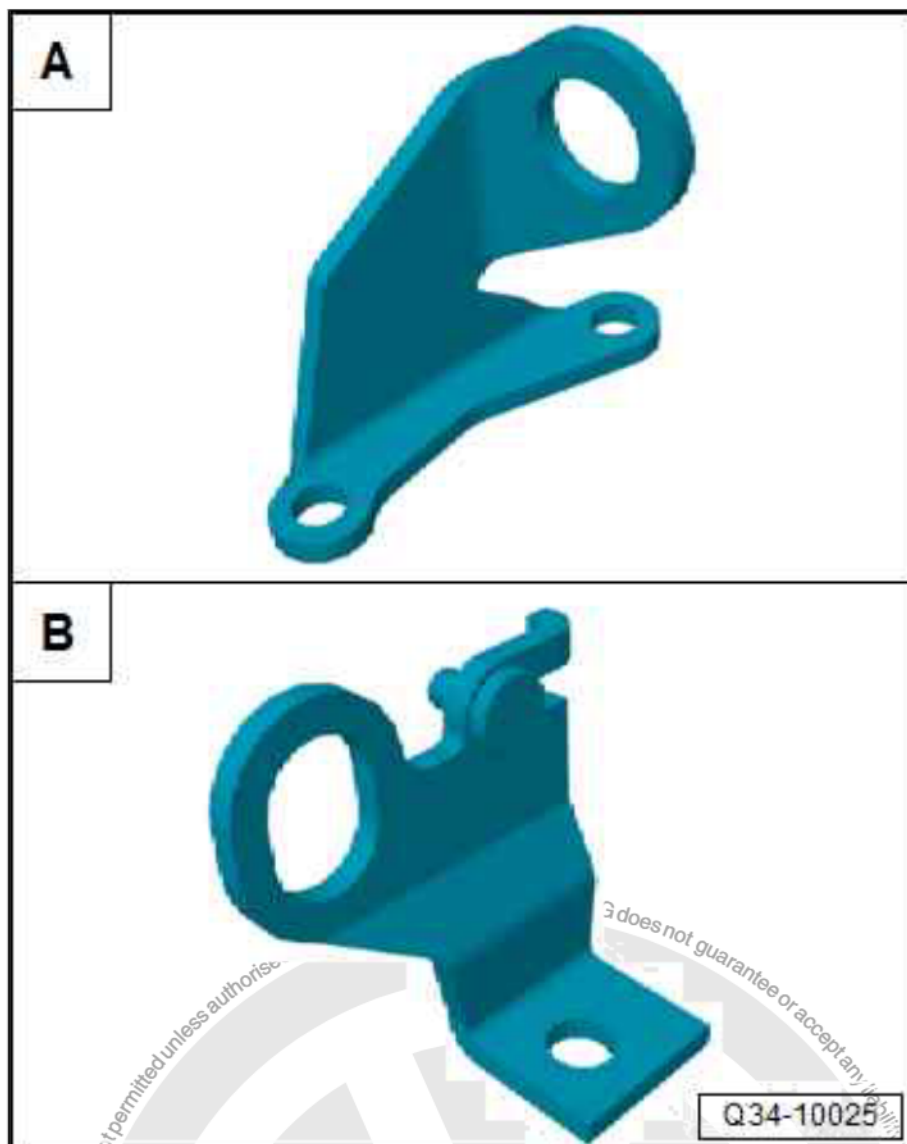
◆ Hooks - 10-222 A/2-





A - -030 103 390 F- (pulley side). Assignment: ➤ Electronic Parts Catalog "ETKA"

B - -030 103 390 G- (flywheel side). Assignment: ➤ Electronic Parts Catalog "ETKA"



## 2.1.1 Removal



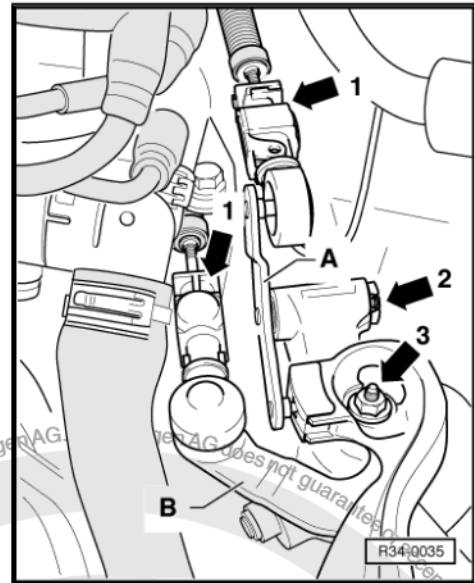
### Note

- ◆ Check whether the vehicle has a coded radio. If so, solicit the anti-theft code before disconnecting the Battery - A- .
- ◆ When connecting the Battery - A- check vehicle equipment (radio, clock, electric locks, electric windows, etc.), according to the repair manual and/or instructions of use
- Disconnect and remove the Battery - A- ➤ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .
- Remove the console from the Battery - A- ➤ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery

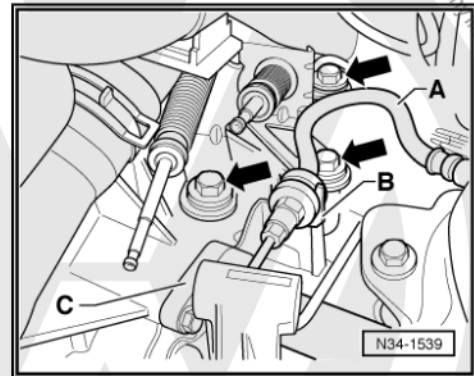


Continuation for vehicles with inversion lever "metal":

- Unlock the locks -arrow 1- of the cable fastening elements. Then remove the cables from the fastening elements.
- Loosen the fastening nut -arrow 3- and remove the gearbox selector lever -B-.
- Remove circlip -arrow 2- from inversion lever -A- and remove lever.



- Remove fastening screws -arrows- from transmission cable fastening support and remove fastening support from transmission cables.
- Remove tubing and hose assembly -A- from support -B- located on gearbox.
- Remove the slave cylinder on the hydraulic drive -C- without opening the pipes and fasten it.

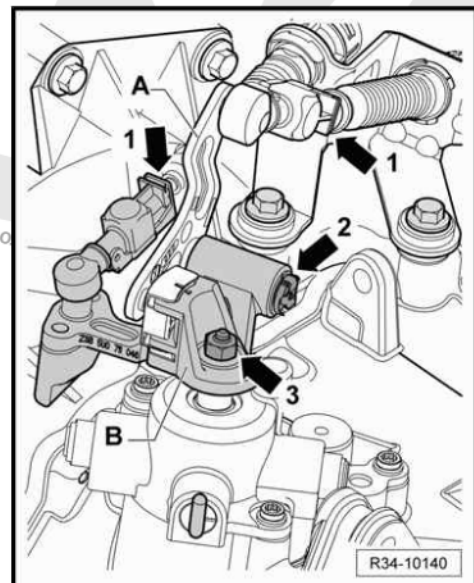


Note

*Do not press the clutch pedal.*

or

- Unlock the locks -arrow 1- of the cable fastening elements. Then remove the cables from the fastening elements.
- Loosen the fastening nut -arrow 3- and remove the gearbox selector lever -B-.
- Remove circlip -arrow 2- from inversion lever -A- and remove lever.





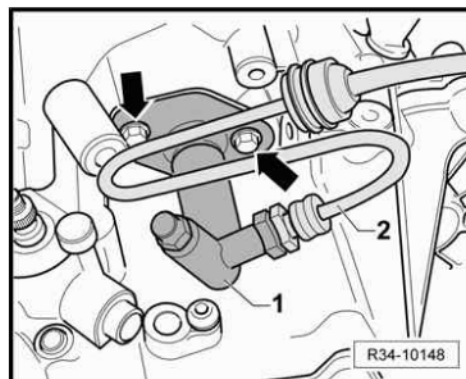


- Loosen fastening screws -arrows- and remove slave cylinder from hydraulic drive -1- without opening tubing -2-.

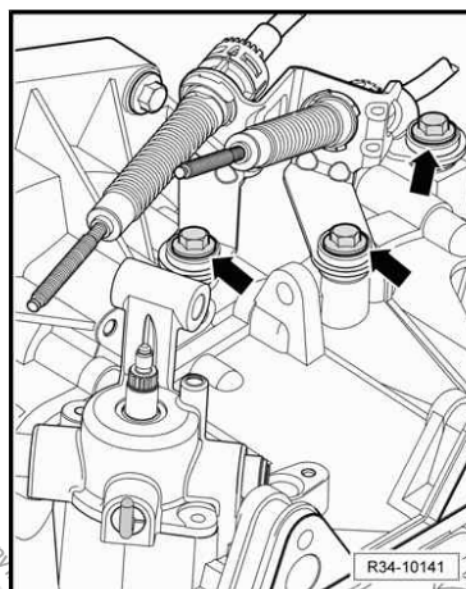


Note

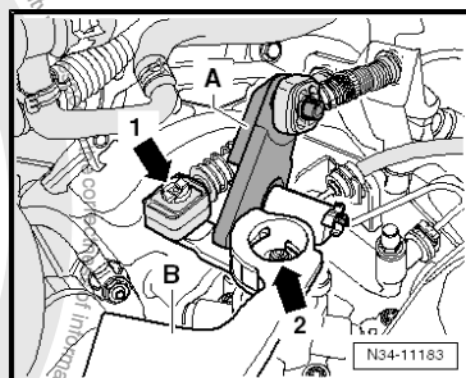
*Clutch pedal must not be depressed.*



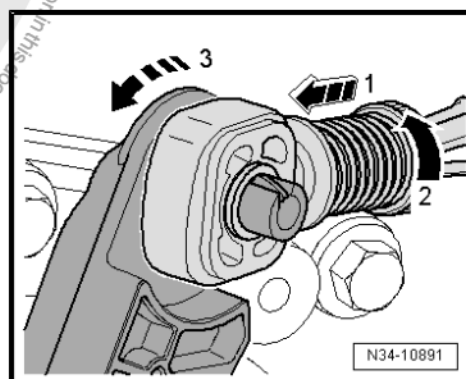
- Loosen securing bolts -arrows- of the gearbox cable mounting bracket.
  - Remove the cables mounting bracket from the gearbox.
- Continuation for vehicles with inversion lever "plastic":



- Remove lock -arrow 1- from selector lever cable -B-.
- Then remove gear selector cable.
- Remove the hex nut -arrow 2- and remove the selector lever -B-.



- Press the mechanism forward, up to the buffer -in direction of arrow 1- and then remove it by turning it to the left -in direction of arrow 2-.
- Then press the lever forward -in direction of arrow 3-.

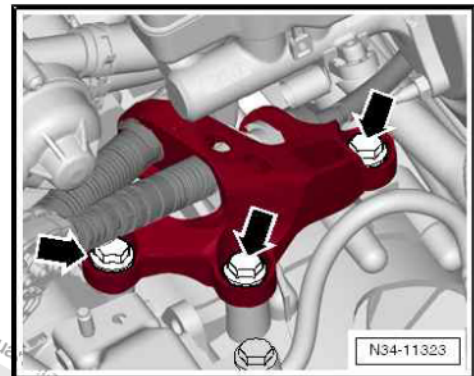




- Remove the clip -arrow 1- and remove the inversion lever along with the fastening of the selector cable.



- Loosen securing bolts -arrows- of the gearbox cable mounting bracket.
- Remove the cables mounting bracket from the gearbox.



- Loosen fastening screws -arrows- and remove slave cylinder from hydraulic drive -1- without opening tubing -2-.

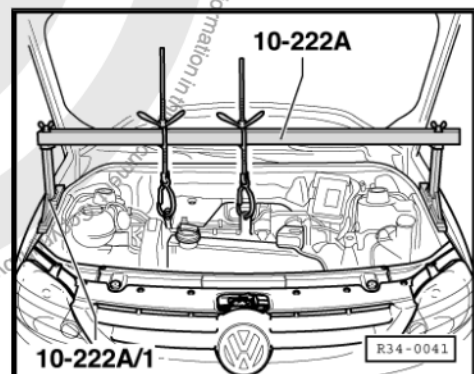
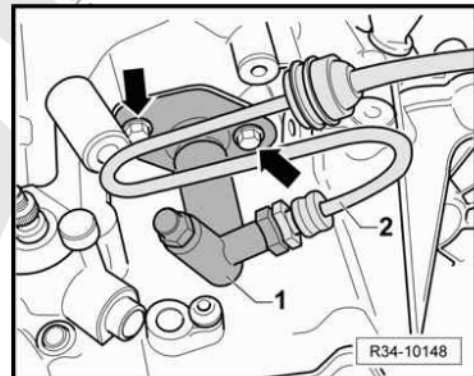


#### Note

*Clutch pedal must not be depressed.*

Continued for all vehicles:

- Remove ground wire from the upper securing bolt of the engine/gearbox.
- Remove upper screws fastening the engine to gearbox.
- Remove the upper securing bolt of the Starter - B- .
- Install Bracket or VW 061 - 10-222A- with Support - 10-222 A/ 1- and sustain slightly the engine/gearbox. Remove the air filter if necessary.





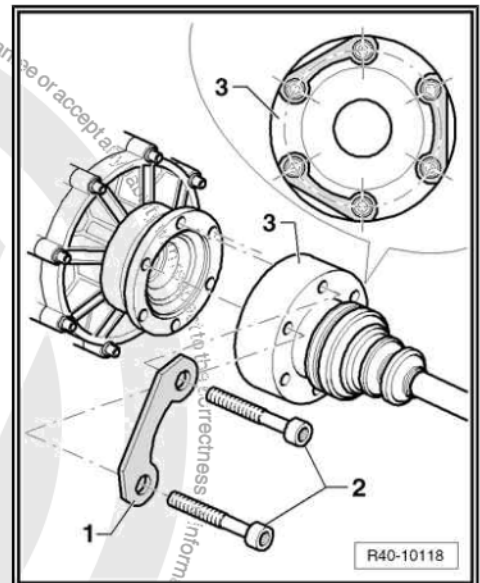
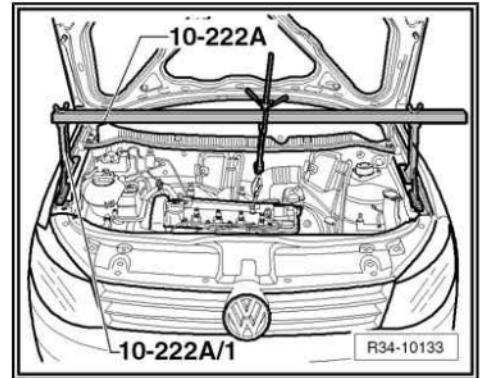
or



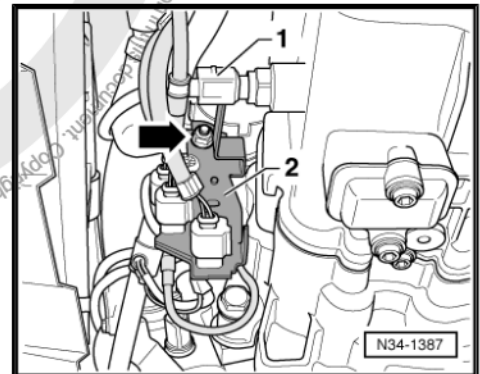
#### Note

*If necessary, use the lifting eyes -030 103 390 F- (on pulley side), -030 103 390 G- (on inertial flywheel side). Assignment: ⇒ Electronic Parts Catalog "ETKA"*

- Relieve the weight of the engine/gearbox assembly through the spindles.
- Lift the vehicle.
- Slightly loosen the securing bolts (left and right) -2- of the drive shafts with constant velocity joint -3- to the transmission drive flanges.
- Remove the left side wheel.
- Remove the left front wheel arch cover ⇒ General body repairs, exterior; Rep. gr. 66 ; External equipment .

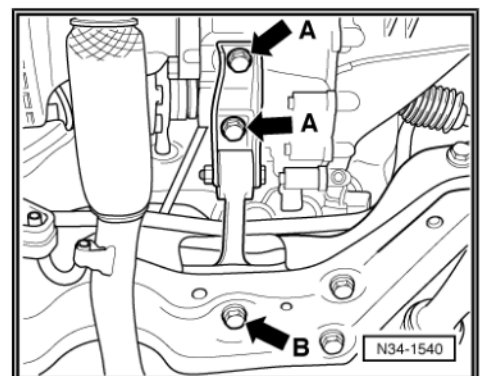


- Disengage connector -1- from reverse gear light switch - F4- .
- Loosen the securing nut -arrow- and remove the cable support -2- from the Starter - - .
- Remove the Starter - B- ⇒ Electrical system; Rep. gr. 27 ; Starter, alternator, battery .
- Remove connectors' bracket.



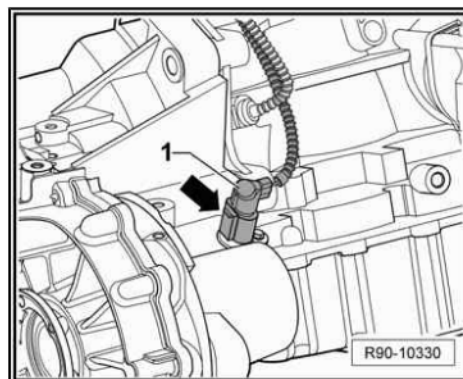
- Remove the fastening screws -arrows A- and -arrows B- and remove pendulum support.

For vehicles without ABS:





- Disengage connector -1- from the Speed sensor - G22- .
- Remove the front exhaust tube ⇒ Engine; Rep. gr. 26 ; Exhaust system .



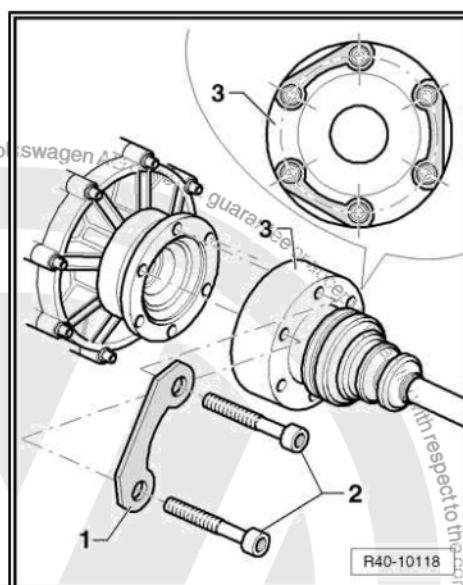
- Remove the securing bolts (left and right) -2- of the drive shafts with constant velocity joint -3- to the transmission drive flanges.



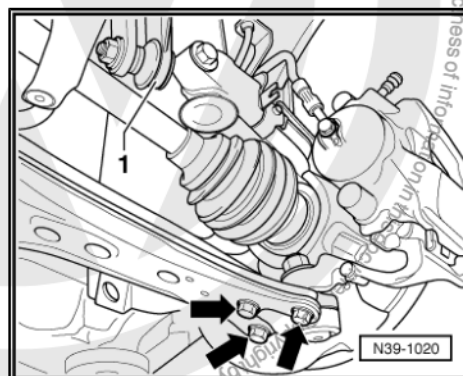
#### Note

*The drive shafts with constant velocity joint must not be pressed downwards. Otherwise, the internal articulation will be damaged due to excessive tilt. Place the drive shafts upwards and fasten them with wire on the suspension strut.*

- Mark the installation position of the screws that fasten the lower articulation of the suspension's left wishbone (transversal).



- Remove the screws -arrows-; consult ⇒ Chassis, axles, steering; Rep. gr. 40 ; Front suspension .
- Remove the coupling rod -1- from the anti-roll bar.



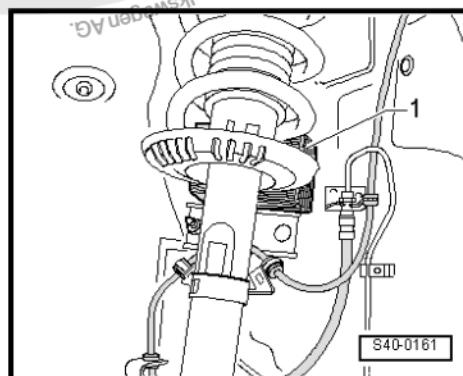
- Push the suspension strut outwards and support it with a wooden wedge -1- (for example) and, at the same time, pulling it away from the (transversal) wishbone.
- Place the final drive with constant velocity joint (left side) upwards and fasten it with wire on the suspension strut.



#### Note

*The drive shaft must not be pressed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*

- Lower the vehicle.





- Remove the securing bolts -arrows- from the engine/gearbox support (left side).
- Carefully tilt the engine/gearbox aggregate. To do that, turn the two screws on the Bracket or VW 061 - 10-222A- by approximately 90 mm downwards.



#### Note

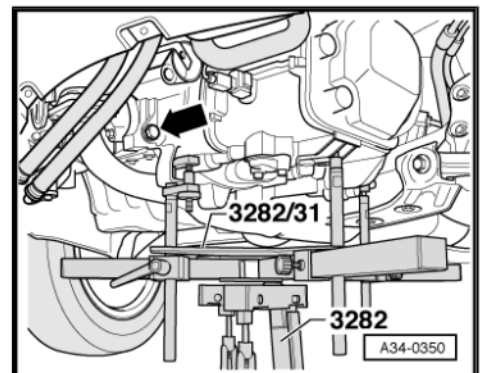
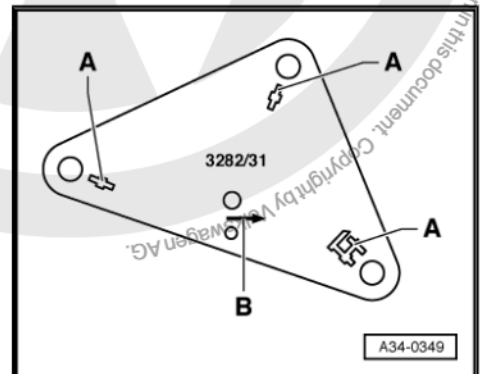
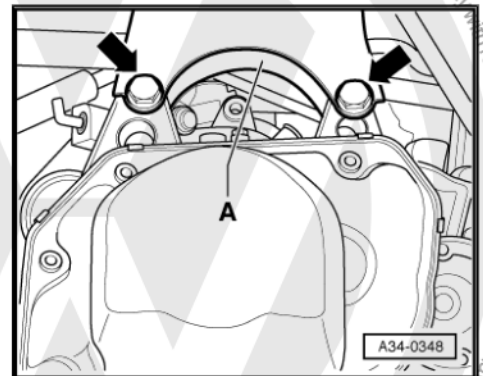
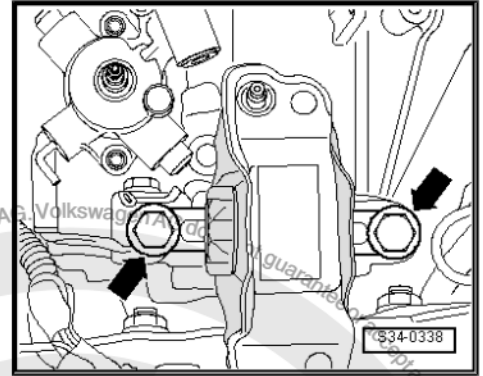
*When lowering the engine/gearbox, make sure the differential is not held on the auxiliary frame (assembly mounting).*

- Thus, it should be possible accessing the screws -arrows- that fasten the console -A-.
- Remove the fastening screws -arrows- and remove the console -A-.
- Install Bracket - 3282- with Shim - 3282/31- to remove the gearbox.
- Install the shift unit arms aligned with the shim holes.

The symbols -A- on the Shim - 3282/31- show the supports required, and arrow -B- indicates run direction.

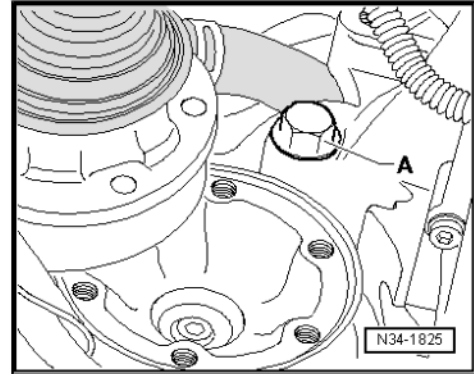
- Place the Gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A- under the gearbox.

- Align the shim and engage the safety bracket to the gearbox.
- Fasten the gearbox to the Support - 3282- and remove the engine/gearbox fastening screw -arrow-.

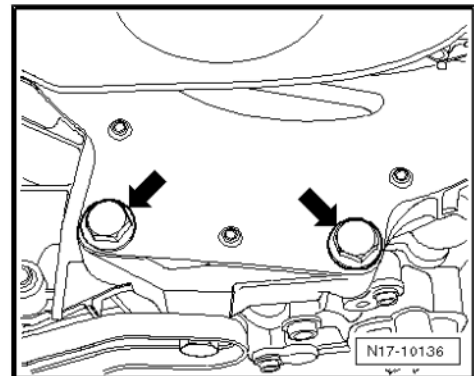




- Remove the engine/gearbox fastening screw -A- from above the drive flange (right side).



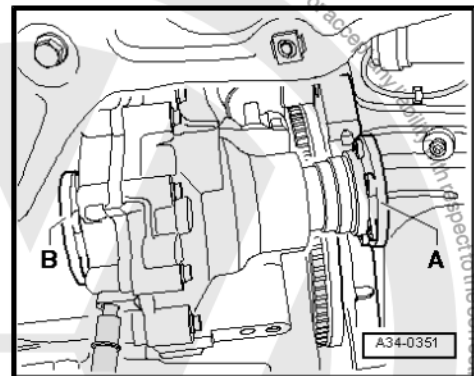
- For vehicles with crankcase on plate, it is necessary to remove the fastening screws -arrows- from the cover plate on the engine crankcase area.
- Remove the lower fastening screws for the engine/gearbox.
- Separate the gearbox from the engine and rotate it carefully towards the auxiliary frame (assembly mountings).
- Carefully press the engine outwards with the help of a 2nd operator.



#### Caution

*Prevent the engine/gearbox from touching the electro fan/radiator during this operation.*

- Rotate the gearbox downwards by the differential region.
- Next, carefully lower the gearbox passing the right drive flange -A- close by the flywheel/intermediate plate, and the left drive flange -B- close by the auxiliary frame (assembly mountings).
- When lowering, change the gearbox position by the spindle of the gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A- .



## 2.1.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



#### WARNING

*Always replace self-locking screws/nuts subject to angular torque.*

- ♦ *When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00*
- ♦ *Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"*





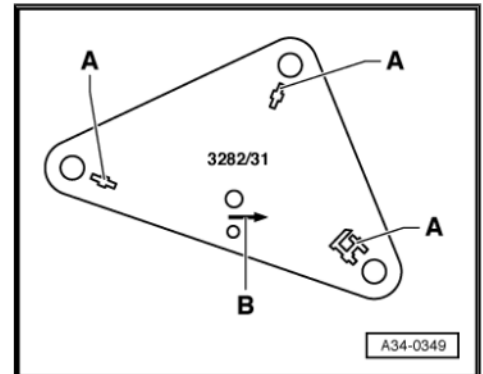
- Clean primary shaft splines and lubricate them lightly with Lubricating grease - G 000 100- .

The clutch plate can easily displace from one side to another on the input shaft.

- Check whether the engine/transmission alignment pins are installed on the cylinder block, install them, if absent.
- Make sure the intermediate plate is correctly installed on engine.
- Install Bracket - 3282- with Shim - 3282/31- to install the gearbox.

The symbols -A- on the Shim - 3282/31- show the supports required, and arrow -B- indicates run direction.

- Align the plate parallel to the gearbox and engage safety bracket to the gearbox.
- Fasten gearbox to Support - 3282- .
- Place gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A- under the vehicle. In such a way that the arrow -B- on Bracket - 3282- is toward the vehicle driving direction.
- Ask a 2nd operator to carefully push the engine forward.



#### Caution

*Prevent the engine/gearbox from touching the electro fan/radiator during this operation.*

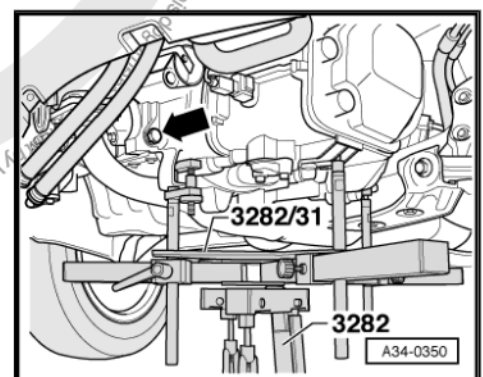
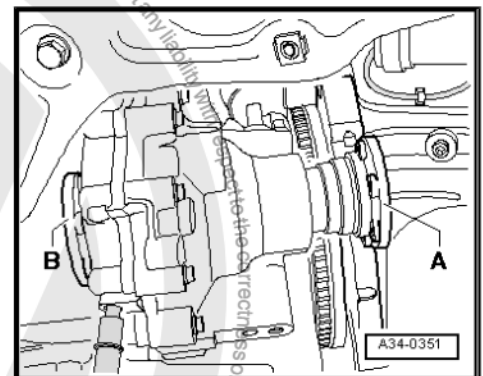
- Carefully raise the gearbox passing the right drive flange -A- close by the flywheel/intermediate plate, and the left drive flange -B- close by the auxiliary frame (assembly mountings).
- When raising, change the gearbox position by the spindle of the Gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A- .
- Then, rotate the gearbox upward through over the differential region with the Support's - 3282- , spindles.
- Install the gearbox.



#### Note

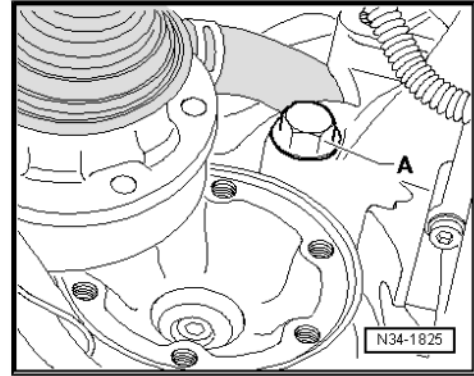
*Pay attention to prevent damages on the cooling hose, located between engine and radiator, and the power steering pipes.*

- Install and tighten the engine/gearbox fastening screw -arrow-.

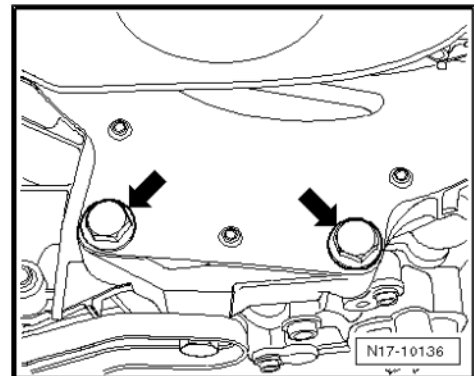




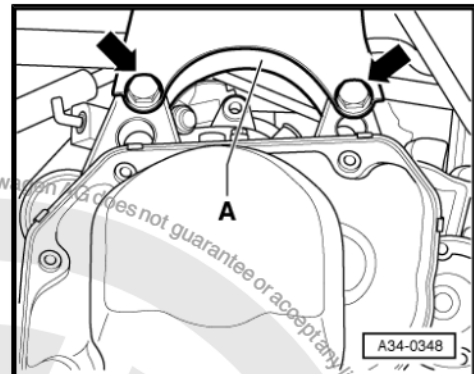
- Install and tighten the engine/gearbox fastening screw -A- from above the drive flange (right side).



- For vehicles with crankcase on plate, it is necessary to install a cover plate arrow on the engine crankcase area.
- Install and tighten the lower engine/gearbox fastening screws -arrow-.



- Install the gearbox console -A- using new bolts -arrows-.
- Lower the vehicle.
- Align engine/gearbox aggregate, by placing it in assembly position. To do that, turn the two screws on the Bracket or VW 061 - 10-222A- upwards.

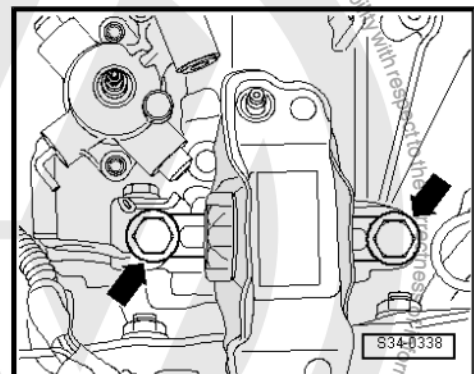


- Install and tighten the securing bolts -arrows- of the engine/gearbox support (left side).



#### WARNING

- ◆ Do not remove the Support or VW 061 - 10-222A- until the bolts of the engine/gearbox support have been tightened (left side).
- ◆ Tighten the engine/gearbox carrier securing bolts free of tension. Refer to ⇒ Engine; Rep. gr. 10 ; Cylinders, cylinder block, support, protector .

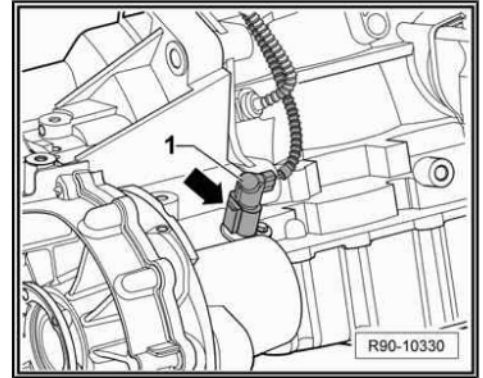


- Install and tighten the upper screws that fasten the engine to gearbox.
- Lift the vehicle.

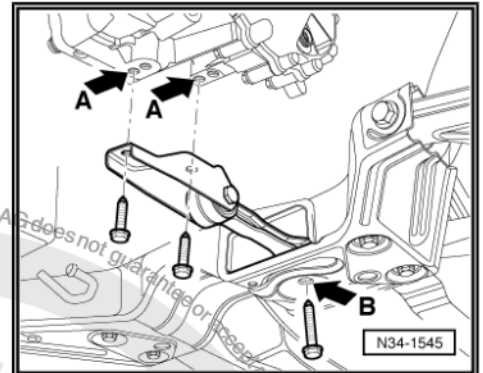
For vehicles without ABS:



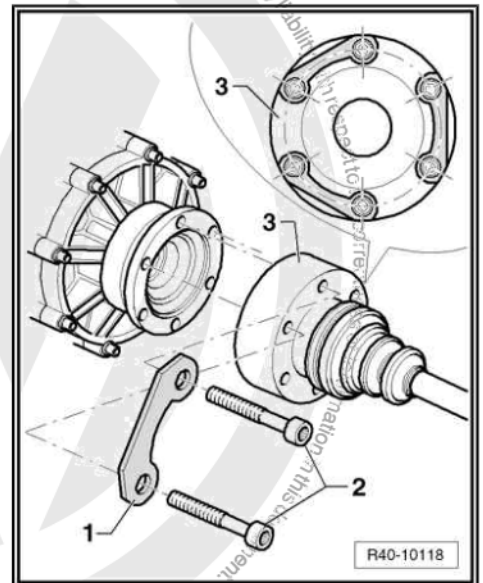
- Connect the connector -1- to Speed sensor - G22- .



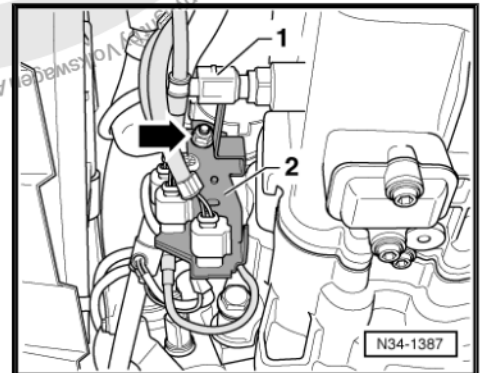
- Install pendulum support -arrows A- and -arrow B- by using new screws.
- Install front exhaust system ⇒ Engine; Rep. gr. 26 ; Exhaust system .
- Install the screws that fasten the lower articulation of the suspension's left wishbone. Refer to ⇒ Chassis, axles, steering; Rep. gr. 40 ; Front suspension .
- Install the coupling rod in the anti-roll bar. Refer to ⇒ Chassis, axles, steering; Rep. gr. 40 ; Front suspension .



- Install the securing bolts (left and right) -2- of the drive shafts with constant velocity joint -3- to the transmission drive flanges. Refer to ⇒ Chassis, axles, steering; Rep. gr. 40 ; Front suspension .
- Install the Starter - B- ⇒ Electrical system ; Rep. gr. 27 ; Starter, alternator, battery .
- Install connectors on their brackets.



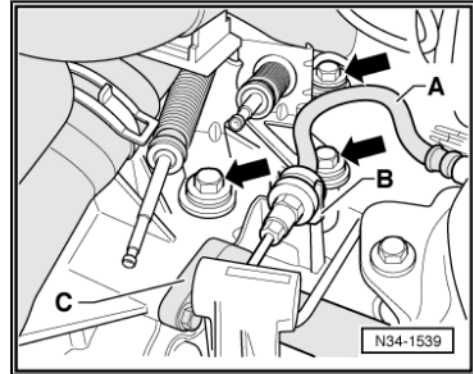
- Install the connectors bracket -2- on the securing bolt -arrow- of the Starter - - .
- Disengage connector -1- from reverse gear light switch - F4- .
- Install the ground wire of the upper securing bolt of the engine/ transmission.





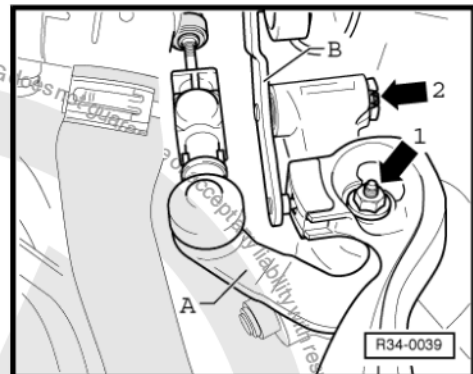
- Install the slave cylinder of the hydraulic drive -C-.
- Install tubing and hose assembly -A- on support -B- located on transmission.
- Install the cable fastening support on transmission -arrows-.

Continuation for vehicles with inversion lever "metal":



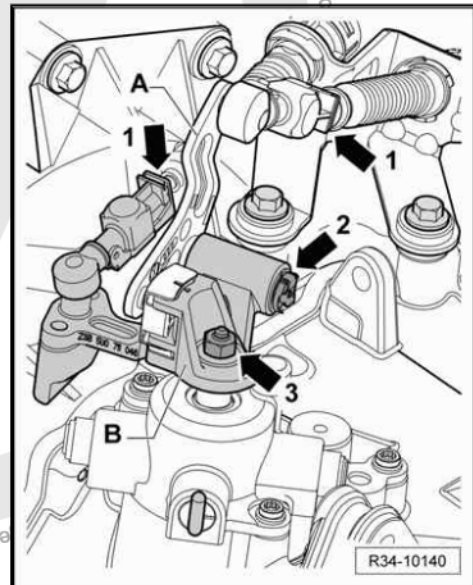
- Install gearbox selector lever -A-.
- Tighten hex nut -arrow 1-.
- Install inversion lever -B- by fastening it with circlip -arrow 2-.
- Install gate selector cables on the corresponding fastening elements.

or



- Install selector lever -B- and tighten fastening nut -3-.
- Install inversion lever -A- by fastening it with a new circlip -arrow 2-.
- Install gate selector cables on the corresponding fastening elements.

Continuation for vehicles with inversion lever "plastic":

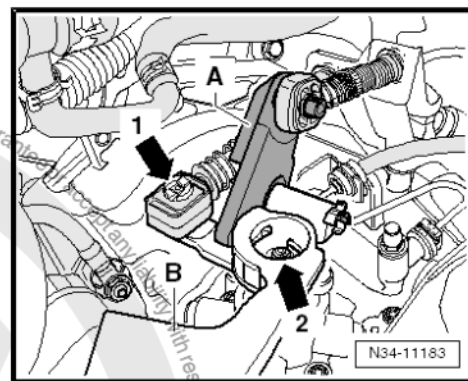




- Install selector lever -B- and tighten fastening nut -arrow 2-.
- Install inversion lever -A- by fastening it with circlip.
- Install gate selector cables on the corresponding fastening elements.

Continuation:

- Adjust the gear selection mechanism ⇒ [page 68](#) .
- Install left front wheel arch cover ⇒ General body repairs, exterior; Rep. gr. 66 ; External equipment .
- Install the left front wheel. Tightening torques, refer to: ⇒ Running gear, axles, steering; Rep. gr. 44 ; Vehicle wheels, tires, measurement .
- Check gear oil level and fill, if necessary ⇒ [page 104](#) .
- Install the Battery - A- console ⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .



For vehicles with air filter located behind the Battery - A- :

- Install air filter (petrol/ethanol engine) ⇒ Engine; Rep. gr. 24 ; Supply system - fuel injection .
- Install air filter (petrol/ethanol engine) ⇒ Engine; Rep. gr. 23 ; Supply system - fuel injection .
- Install and connect the Battery -- ⇒ Electrical equipment; Rep. gr. 27 ; Starter motor, alternator, battery .

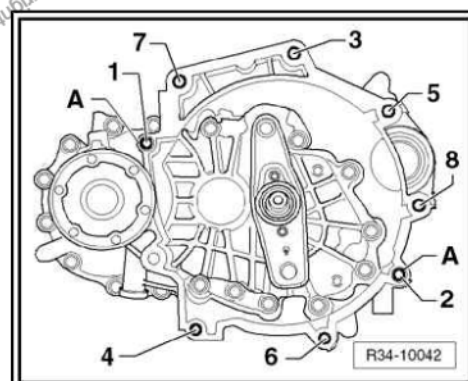
## 2.1.3 Tightening torques

Vehicles with 1.0 L engine



Note

- ♦ *Strictly follow the tightening sequence (gearbox to engine) showed by the illustration*
- ♦ *-Pos. A- - Adjustment pins*



Position	Bolts	Tightening torques
1	M 12 x 70	80 Nm
2	M 12 x 65	80 Nm
3	M 12 x 55	80 Nm
4	M 10 x 35	40 Nm
5	M 12 x 125	80 Nm
	♦ Also used to fasten the Starter - B-	
6	M 10 x 35	40 Nm
7	M 12 x 55	80 Nm
8	M 12 x 125	80 Nm
	♦ Also used to fasten the Starter - B-	



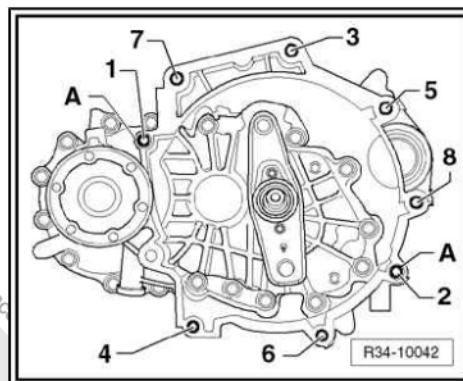
## Vehicles with 1.6 L engine



### Note

- ♦ Strictly follow the tightening sequence (gearbox to engine) showed by the illustration
- ♦ -Pos. A- - Adjustment pins

Position	Bolts	Tightening torques
1	M 12 x 70	80 Nm
2	M 12 x 55	80 Nm
3	M 12 x 55	80 Nm
4	M 10 x 50 / M 10 x 55 2)	40 Nm
5	M 12 x 125 ♦ Also used to fasten the Starter - B-	80 Nm
6	M 10 x 50 / M 10 x 55 2)	40 Nm
7	M 12 x 55	80 Nm
8	M 12 x 125 ♦ Also used to fasten the Starter - B-	80 Nm



2) Interchangeable

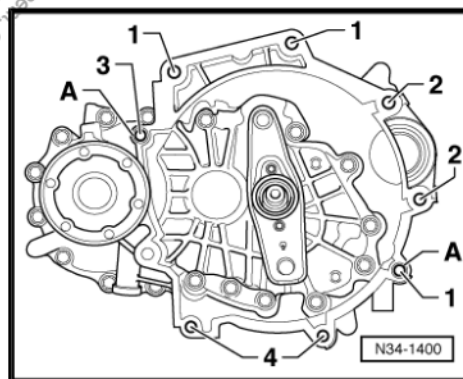
## Vehicles with 1.2 L engine (40 kW and 47 kW)



### Note

-Pos. A- - Adjustment pins

Position	Bolts	Quantity	Tightening torques
1	M 12 x 65	3	80 Nm
2	M 12 x 135 ♦ Also used to fasten the Starter - B-	2	80 Nm
3	M 12 x 80	1	80 Nm
4	M 10 x 60	2	40 Nm







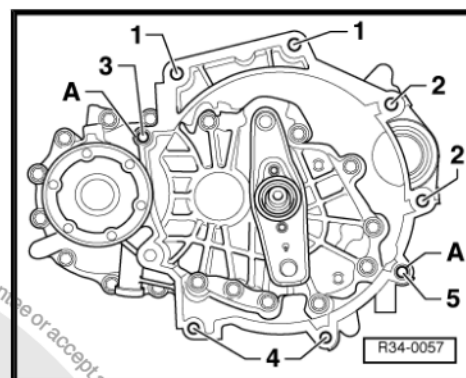
# Vehicles with 1.4 L engine (55 kW)



Note

-Pos. A- - Adjustment pins

Position	Bolts	Quantity	Tightening torques
1	M 12 x 55	2	80 Nm
2	M 12 x 125 ♦ Also used to fasten the Starter - B-	2	80 Nm
3	M 12 x 70	1	80 Nm
4	M 10 x 35	2	40 Nm
5	M 12 x 65	1	80 Nm



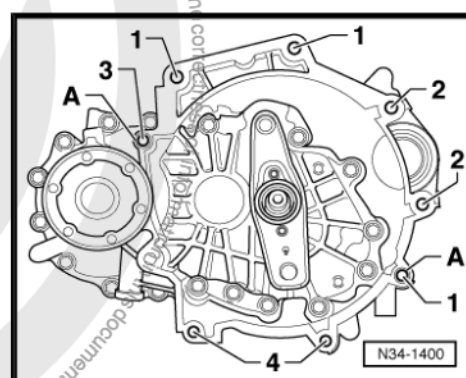
# Vehicles with 1.4 L engine (63 kW and 74 kW)



Note

-Pos. A- - Adjustment pins

Position	Bolts	Quantity	Tightening torques
1	M 12 x 65	3	80 Nm
2	M 12 x 140 ♦ Also used to fasten the Starter - B-	2	80 Nm
3	M 12 x 80	1	80 Nm
4	M 10 x 50 / M 10 x 55 <sup>3)</sup>	2	40 Nm



3) Interchangeable

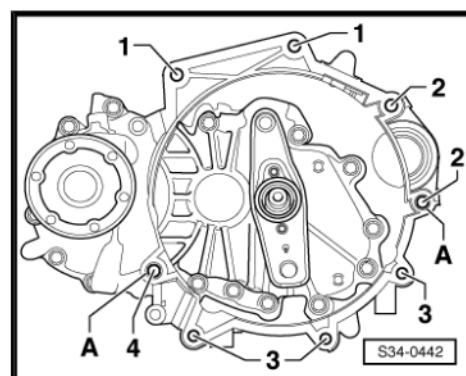
# Vehicles with 1.4 L engine (51 kW - Diesel)



Note

-Pos. A- - Adjustment pins

Position	Bolts	Quantity	Tightening torques
1	M 12 x 70	2	80 Nm
2	M 12 x 150 ♦ Also used to fasten the Starter - B-	2	80 Nm
3	M 10 x 70	3	40 Nm
4	M 12 x 80	1	80 Nm



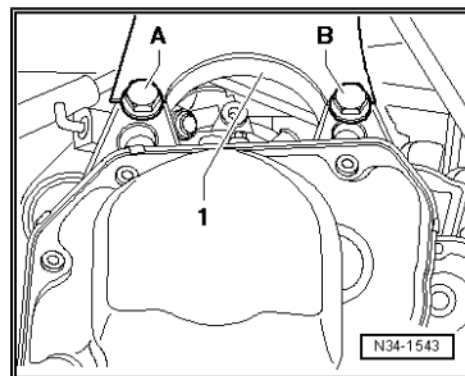


Console -1- to gearbox:

1 - Console to gearbox

A - 40 Nm + 90° (Replace after every removal)

B - 40 Nm + 90° (Replace after every removal)



Support for power unit - transmission

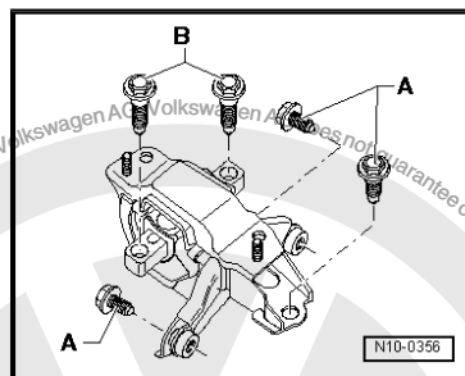
A - 40 Nm + 90° (Replace after every removal)

B - 40 Nm + 90° (Replace after every removal)



Note

Install engine/gearbox mounting without any stress ⇒ Engine;  
Rep. gr. 10 ; Cylinders, cylinder block, support, cover.



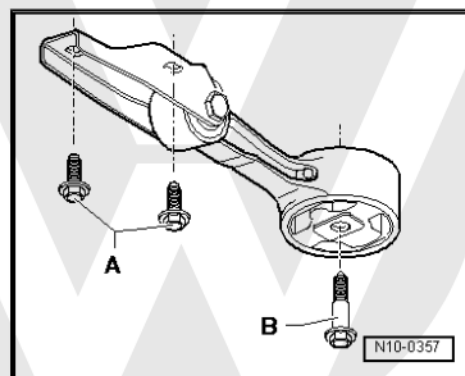
Pendulum support (torque restrictor)

A - 40 Nm + 90° (Replace after every removal)

B - 40 Nm + 90° (Replace after every removal)

For other torques, refer to the respective repair groups

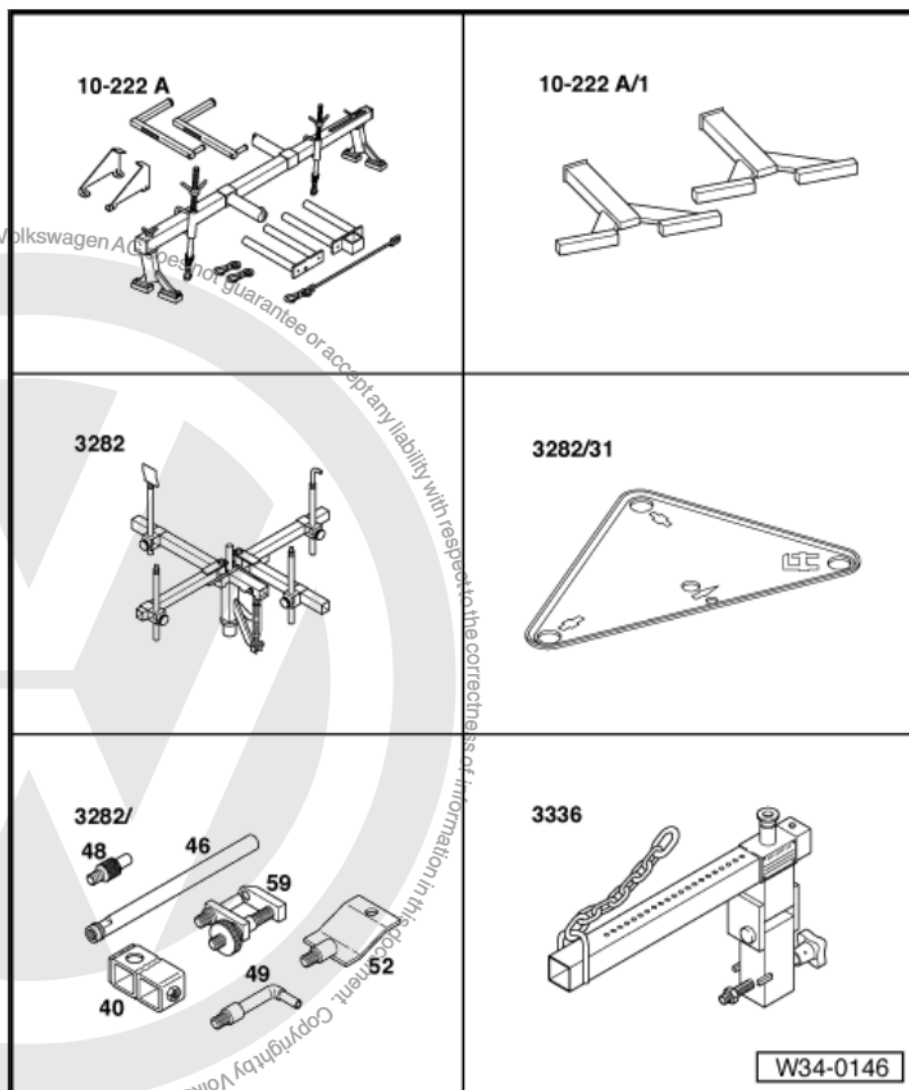
- ◆ Drive shaft with constant velocity joint to drive flange ⇒ Chassis, axles, steering; Rep. gr. 40 ; Front suspension .
- ◆ Lower joint to wishbone (transversal) ⇒ Chassis, axles, steering; Rep. gr. 40 ; Front suspension .
- ◆ Coupling bar to anti-roll bar ⇒ Chassis, axles, steering; Rep. gr. 40 ; Front suspension .



## 2.2 Gearbox for vehicles with engines (CSEA) - remove and install


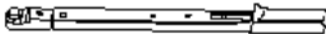
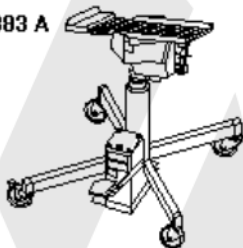


Special tools and workshop  
equipment required



- ◆ Support or VW 061 - 10-222A-
- ◆ Support - 10-222 A/1-
- ◆ Mounting bracket - 3282-
- ◆ Adjustment plate - 3282/31-
- ◆ Pin - 3282/48-
- ◆ Mounting bracket - 3282/59-
- ◆ Mounting bracket - 3336-



<b>V.A.G 1331</b> 	<b>V.A.G 1332</b> 
<b>V.A.G 1383 A</b> 	
	<b>W34-0092</b>

- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-
- ◆ Torque Wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-
- ◆ Gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A-

## 2.2.1 Removal

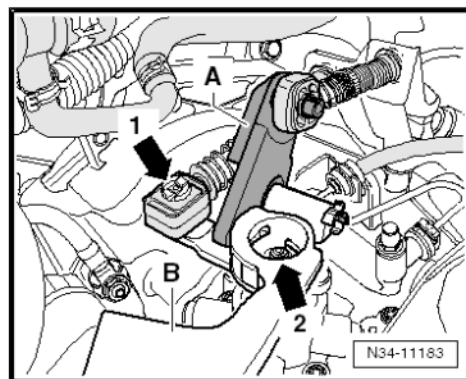


### Note

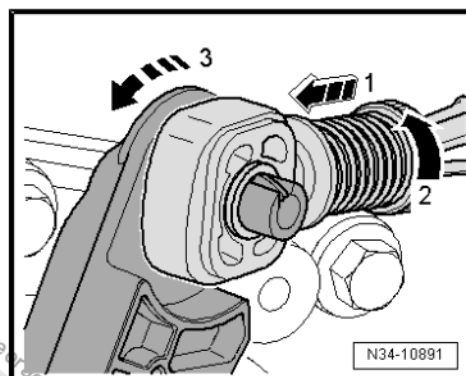
- ◆ *Check whether the vehicle has a coded radio. If so, solicit the anti-theft code before disconnecting the Battery - A- .*
- ◆ *When connecting the Battery - A- , check vehicle equipment (radio, clock, electric locks, electric windows, etc.), according to the repair manual and/or instructions of use*
- Disconnect and remove the Battery - A- ⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .
- Remove the console from the Battery - A- ⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .



- Remove lock -arrow 1- from selector lever cable -B-.
- Then remove gear selector cable.
- Remove the hex nut -arrow 2- and remove the selector lever -B-.



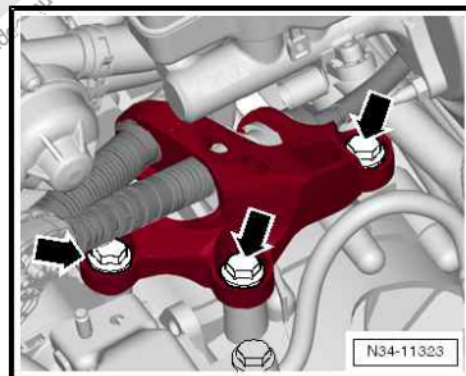
- Press the mechanism forward, up to the buffer -in direction of arrow 1- and then remove it by turning it to the left -in direction of arrow 2-.
- Then press the lever forward -in direction of arrow 3-.



- Remove the clip -arrow 1- and remove the inversion lever along with the fastening of the selector cable.



- Loosen securing bolts -arrows- of the gearbox cable mounting bracket.
- Remove the cables mounting bracket from the gearbox.





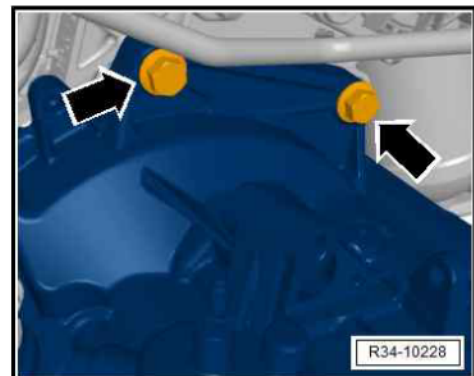
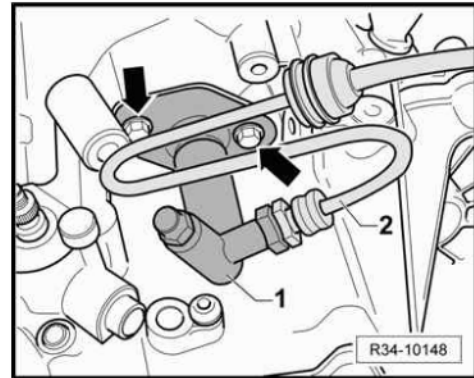
- Loosen fastening screws -arrows- and remove slave cylinder from hydraulic drive -1- without opening tubing -2-.



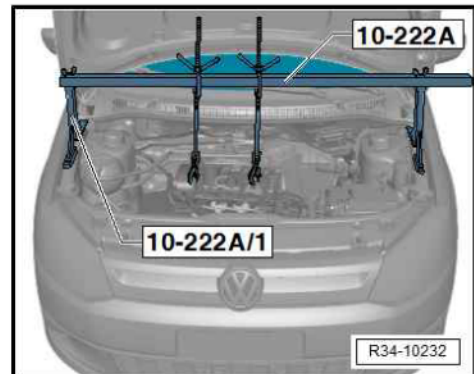
Note

*Clutch pedal must not be depressed.*

- Remove ground wire from the upper securing bolt of the engine/gearbox.
- Remove upper screws -arrows- fastening the engine to gearbox.
- Remove the upper securing bolt of the Starter - B- .



- Install Bracket or VW 061 - 10-222A- with Support - 10-222 A/ 1- and sustain slightly the engine/gearbox. Remove the air filter if necessary.
- Relieve the weight of the engine/gearbox assembly through the spindles.
- Lift the vehicle.

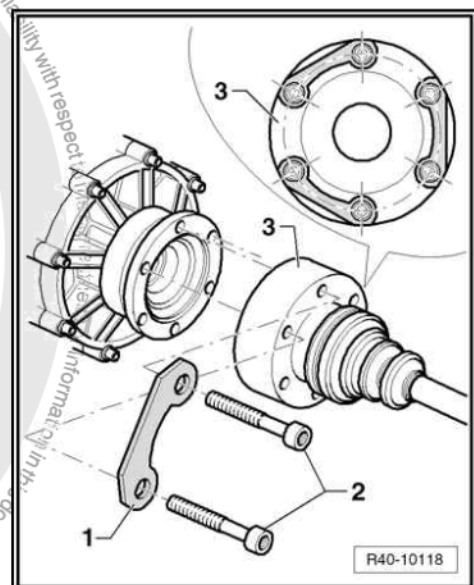


- Slightly loosen the securing bolts (left and right) -2- of the drive shafts with constant velocity joint -3- to the transmission drive flanges.

- Remove the left side wheel.

Remove the left front wheel arch cover ⇒ General body repairs, exterior; Rep. gr. 66 ; External equipment .

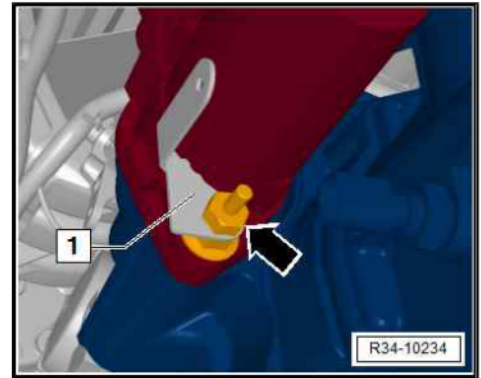
Disengage the Reversing light switch - F4- connector.



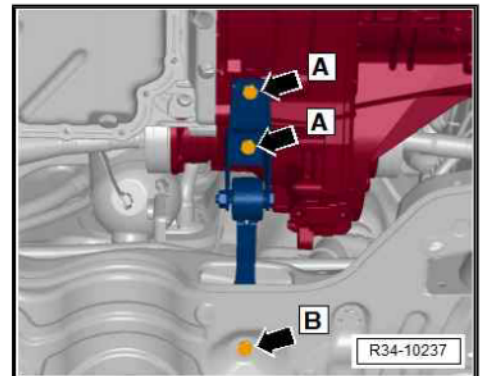




- Loosen the securing nut -arrow- and remove the cable support -1- from the Starter - - .
- Remove the Starter - B- ⇒ Electrical system; Rep. gr. 27 ; Starter, alternator, battery .
- Remove connectors' bracket.



- Remove the fastening screws -arrows A- and -arrows B- and remove pendulum support.



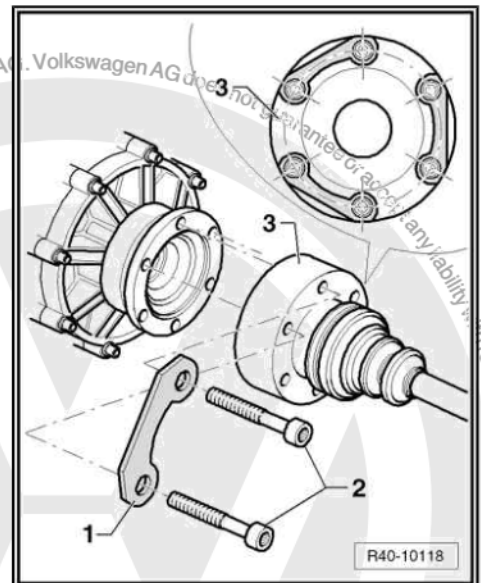
- Remove the securing bolts (left and right) -2- of the drive shafts with constant velocity joint -3- to the transmission drive flanges.



#### Note

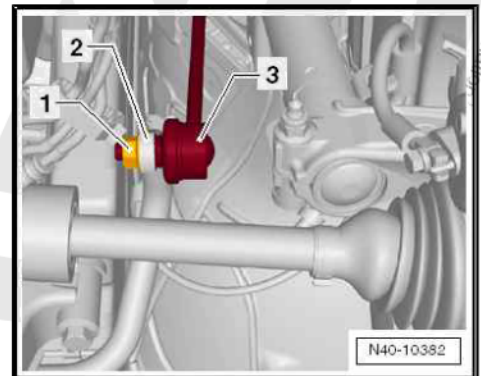
*The drive shafts with constant velocity joint must not be pressed downwards. Otherwise, the internal articulation will be damaged due to excessive tilt. Place the drive shafts upwards and fasten them with wire on the suspension strut.*

Only for vehicles with anti-roll bar



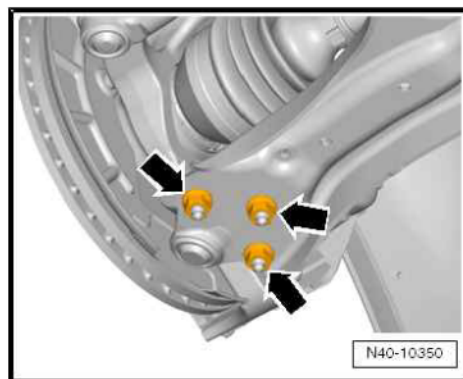
- Remove the hex nut -1- from coupling rod -3- (left side).
- Remove the coupling rod -3- (left side) from the anti-roll bar -2-.

Continuation

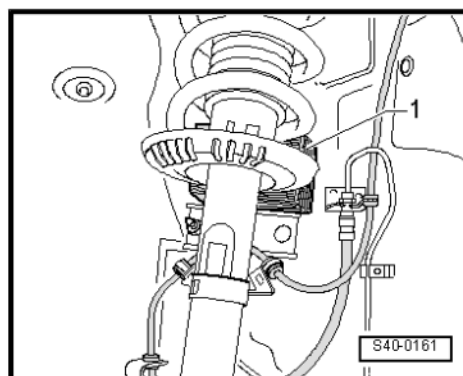




- Remove the securing nuts -arrows-.



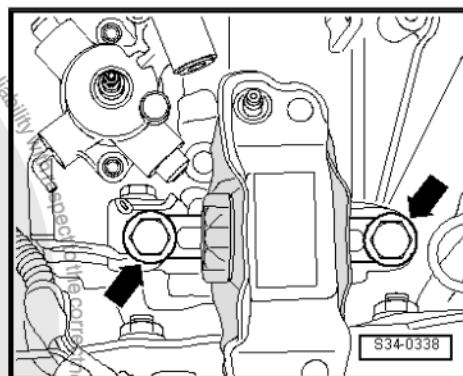
- Push the suspension strut outwards and support it with a wooden wedge -1- (for example) and, at the same time, pulling it away from the (transversal) wishbone.
- Place the final drive with constant velocity joint (left side) upwards and fasten it with wire on the suspension strut.



#### Note

*The drive shaft must not be pressed down. Otherwise, the internal articulation will be damaged due to excessive tilt.*

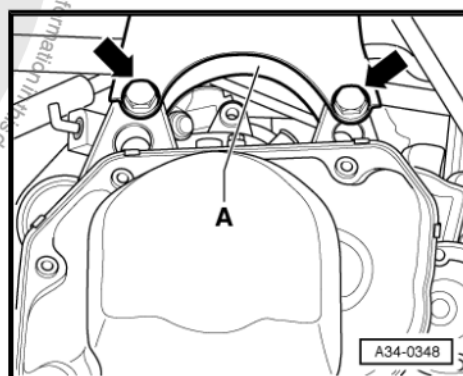
- Lower the vehicle.
- Remove the securing bolts -arrows- from the engine/gearbox support (left side).
- Carefully tilt the engine/gearbox aggregate. To do that, turn the two screws on the Bracket or VW 061 - 10-222A- by approximately 30 mm downwards.



#### Note

*When lowering the engine/gearbox, make sure the differential is not held on the auxiliary frame (assembly mounting).*

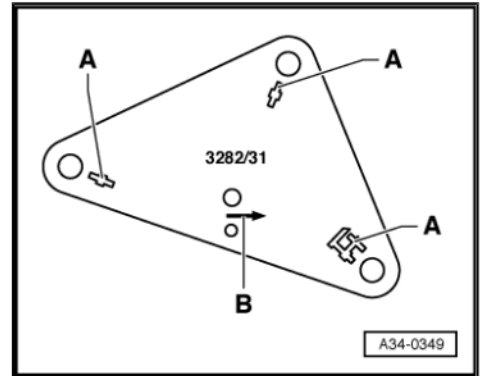
- Thus, it should be possible accessing the screws -arrows- that fasten the console -A-.
- Remove the fastening screws -arrows- and remove the console -A-.
- Install Bracket - 3282- with Shim - 3282/31- to remove the gearbox.
- Install the shift unit arms aligned with the shim holes.



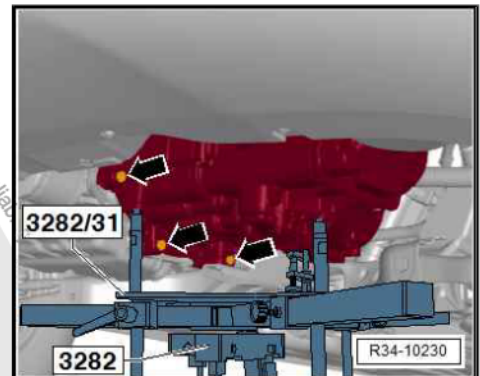


The symbols -A- on the Shim - 3282/31- show the supports required, and arrow -B- indicates run direction.

- Place the Gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A- under the gearbox.



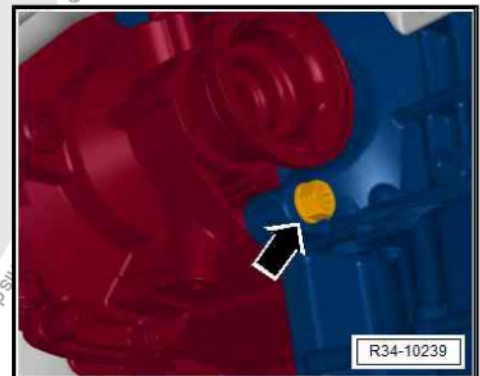
- Align the shim and engage the safety bracket to the gearbox.
- Fasten the gearbox to the Support - 3282- and remove the engine/gearbox fastening screws -arrow-.



Remove the engine/gearbox fastening screw -arrow- from under the drive flange (right side).

Separate the gearbox from the engine and rotate it carefully towards the auxiliary frame (assembly mountings).

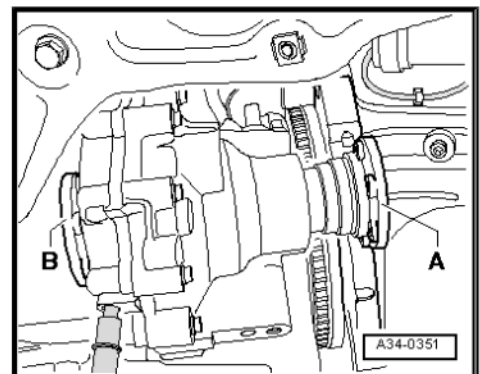
Carefully press the engine outwards with the help of a 2nd operator.



#### Caution

*Prevent the engine/gearbox from touching the electro fan/radiator during this operation.*

- Rotate the gearbox downwards by the differential region.
- Next, carefully lower the gearbox passing the right drive flange -A- close by the flywheel/intermediate plate, and the left drive flange -B- close by the auxiliary frame (assembly mountings).
- When lowering, change the gearbox position by the spindle of the gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A- .



## 2.2.2 Installation

Installation is performed in reverse to removal sequence, considering the following:



#### WARNING

*Always replace self-locking screws/nuts subject to angular torque.*

- ◆ *When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00*
- ◆ *Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"*

- Clean primary shaft splines and lubricate them lightly with Lubricating grease - G 000 100- .

The clutch plate can easily displace from one side to another on the input shaft.

- Check whether the engine/transmission alignment pins are installed on the cylinder block, install them, if absent.
- Make sure the intermediate plate is correctly installed on engine.
- Install Bracket - 3282- with Shim - 3282/31- to install the gearbox.

The symbols -A- on the Shim - 3282/31- show the supports required, and arrow -B- indicates run direction.

- Align the plate parallel to the gearbox and engage safety bracket to the gearbox.
- Fasten gearbox to Support - 3282- .
- Place gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A- under the vehicle. In such a way that the arrow -B- on Bracket - 3282- is toward the vehicle driving direction.
- If necessary, request a 2nd operator to carefully push the engine forward.



#### Caution

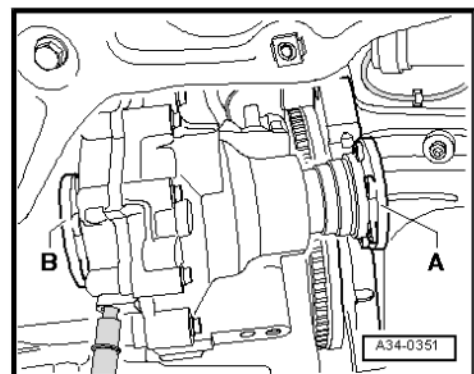
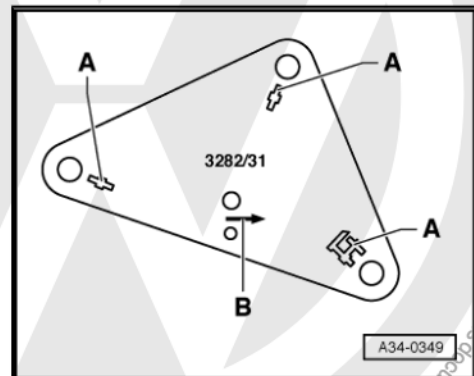
*Prevent the engine/gearbox from touching the electro fan/radiator during this operation.*

- Carefully raise the gearbox passing the right drive flange -A- close by the flywheel/intermediate plate, and the left drive flange -B- close by the auxiliary frame (assembly mountings).
- When raising, change the gearbox position by the spindle of the Gearbox or engine + gearbox set jack or EQ 7081 - VAG 1383A- .
- Then, rotate the gearbox upward through over the differential region with the Support's - 3282- , spindles.
- Install the gearbox.



#### Note

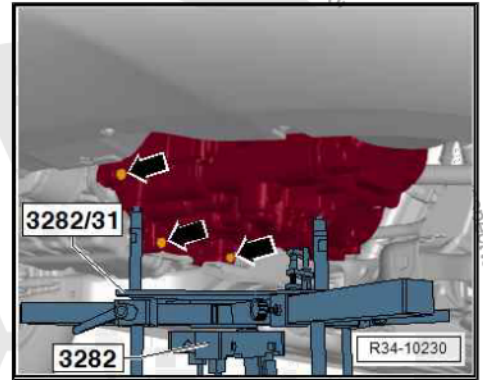
*Pay attention to prevent damages on the cooling hose, located between engine and radiator, and the power steering pipes.*



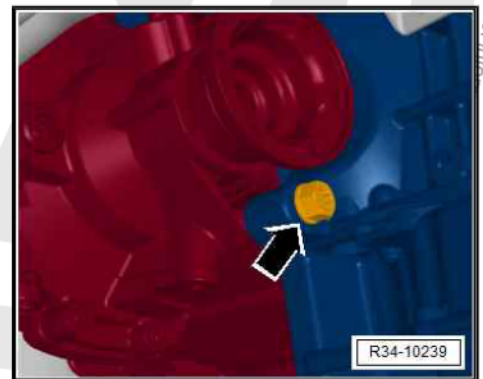




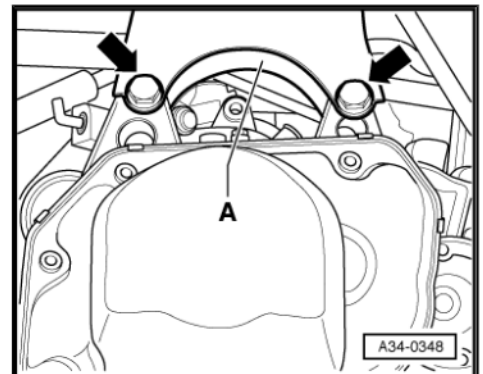
- Install and tighten engine/gearbox fastening screws -arrow-.



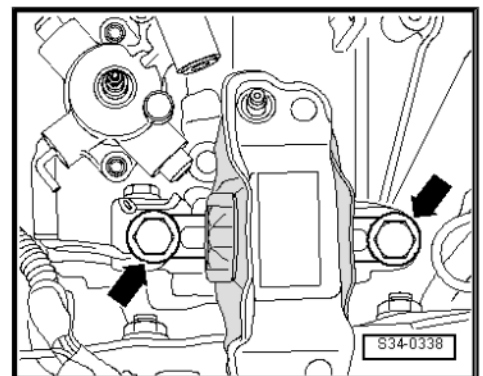
- Install and tighten the engine/gearbox fastening screw -A- from above the drive flange (right side).



- Install the gearbox console -A- using new bolts -arrows-.
- Lower the vehicle.
- Align engine/gearbox aggregate, by placing it in assembly position. To do that, turn the two screws on the Bracket or VW 061 - 10-222A- upwards.



- Install and tighten the securing bolts -arrows- of the engine/gearbox support (left side).

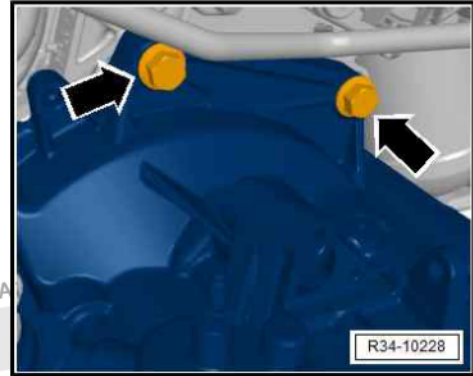


#### WARNING

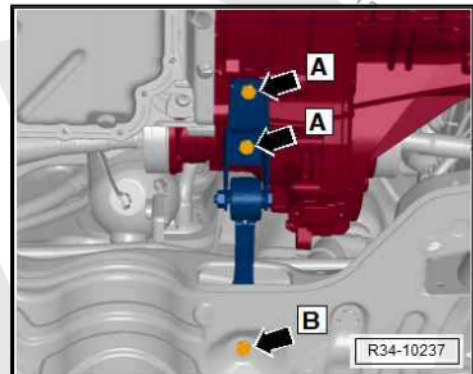
- ◆ *Do not remove the Support or VW 061 - 10-222A- until the bolts of the engine/gearbox support have been tightened (left side).*
- ◆ *Tighten the engine/gearbox carrier securing bolts free of tension. Refer to ➔ Engine; Rep. gr. 10 ; Cylinders, cylinder block, support, protector .*



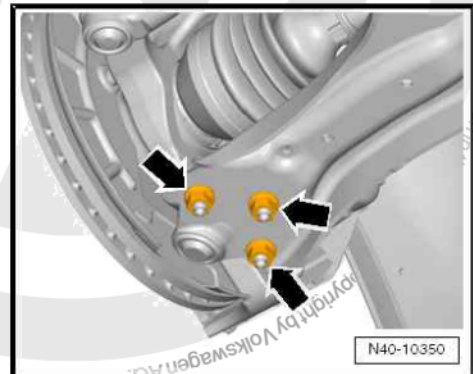
- Install and tighten upper engine/gearbox fastening screws -arrow-.
- Lift the vehicle.



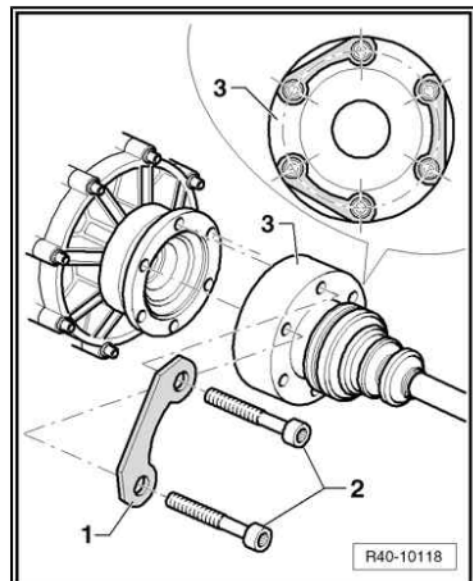
- Install pendulum support -arrows A- and -arrow B- by using new screws.



- Install the nuts -arrows- that fasten the lower articulation of the suspension's left wishbone. Refer to ➤ Chassis, axles, steering; Rep. gr. 40 ; Front suspension.
- Install the coupling rod in the anti-roll bar. Refer to ➤ Chassis, axles, steering; Rep. gr. 40 ; Front suspension .



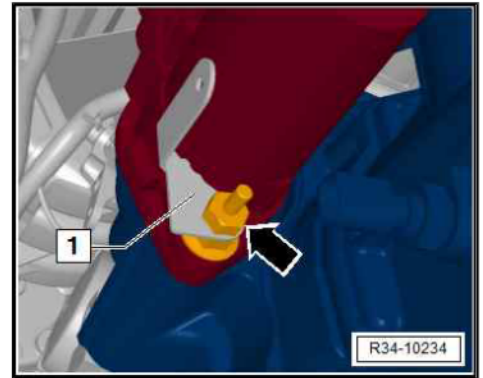
- Install the securing bolts (left and right) -2- of the drive shafts with constant velocity joint -3- to the transmission drive flanges. Refer to ➤ Chassis, axles, steering; Rep. gr. 40 ; Front suspension .
- Install the Starter - B- ➤ Electrical system ; Rep. gr. 27 ; Starter, alternator, battery .
- Install connectors on their brackets.



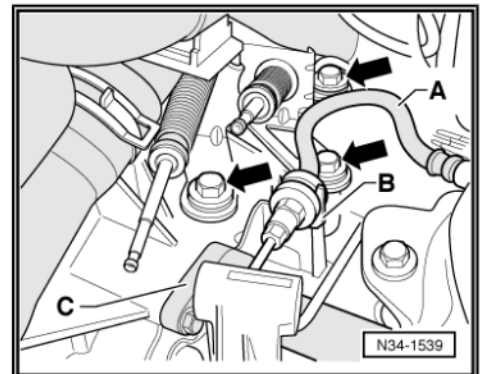




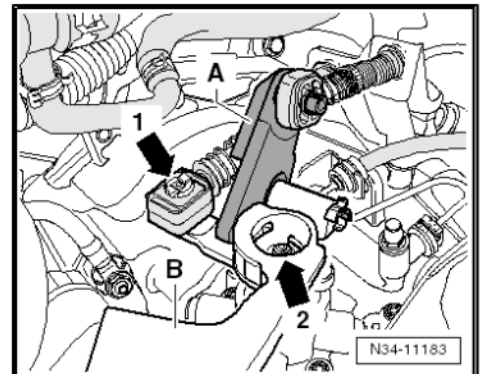
- Install the connectors bracket -1- on the securing bolt -arrow- of the Starter - - .
- Connect the Reverse gear light switch - F4- connector.
- Install the ground wire of the upper securing bolt of the engine/ transmission.



- Install the slave cylinder of the hydraulic drive -C-.
- Install tubing and hose assembly -A- on support -B- located on transmission.
- Install the cable fastening support on transmission -arrows-.



- Install selector lever -B- and tighten fastening nut -arrow 2-.
- Install inversion lever -A- by fastening it with circlip.
- Install gate selector cables on the corresponding fastening elements.



#### Continuation:

- Adjust the gear selection mechanism ⇒ [page 68](#) .
- Install left front wheel arch cover ⇒ General body repairs, exterior; Rep. gr. 66 ; External equipment .
- Install the left front wheel. Tightening torques, refer to: ⇒ Running gear, axles, steering; Rep. gr. 44 ; Vehicle wheels, tires, measurement .
- Check gear oil level and fill, if necessary ⇒ [page 104](#) .
- Install the Battery - A- console ⇒ Electrical equipment; Rep. gr. 27 ; Starter, alternator, battery .
- Install and connect the Battery - - ⇒ Electrical equipment; Rep. gr. 27 ; Starter motor, alternator, battery .



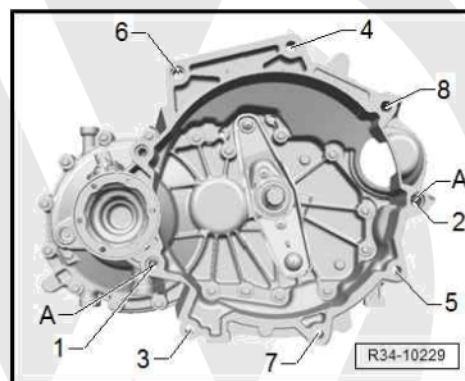
## 2.2.3 Tightening torques

Vehicles with 1.0 L engine



Note

- ♦ *Strictly follow the tightening sequence (gearbox to engine) showed by the illustration*
- ♦ *-Pos. A- - Adjustment pins*



Position	Bolts	Tightening torques
1	M 12 x 70	80 Nm
2	M 12 x 150 ♦ Also used to fasten the Starter - B-	80 Nm
3	M 10 x 55	40 Nm
4	M 12 x 60	80 Nm
5	M 10 x 55	40 Nm
6	M 12 x 60	80 Nm
7	M 10 x 55	40 Nm
8	M 12 x 150 ♦ Also used to fasten the Starter - B-	80 Nm

## 2.3 Gearbox - transport

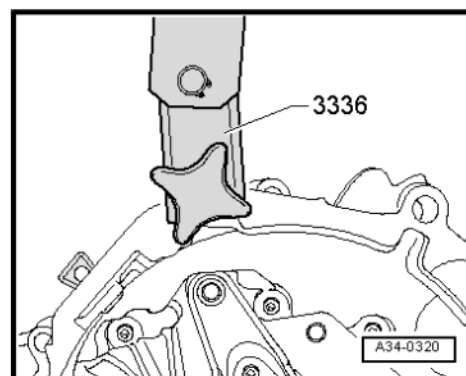
Special tools and workshop equipment required

- ♦ Mounting bracket - 3336-
- ♦ Winch 700 - 1200 Kg - VAS 6100-



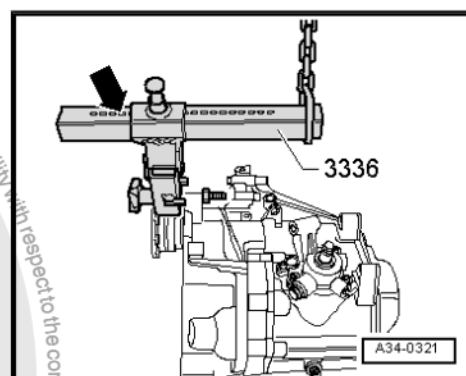


- Install Bracket - 3336- on the gearbox housing.



- Adjust the arm in the guide with the locking pins -arrow-

Number of visible holes = 5





### 3 Gearbox oil level

⇒ ["3.1 Oil level - check", page 104](#)

⇒ ["3.2 Oil level - replenish", page 105](#)

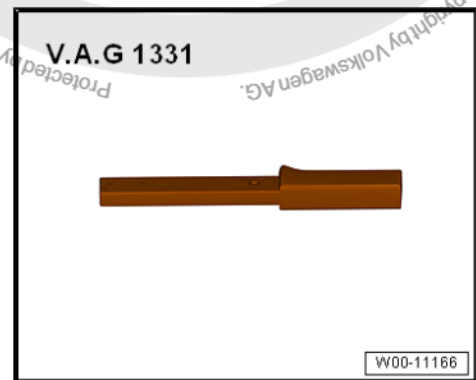
#### 3.1 Oil level - check

Special tools and workshop equipment required

◆ Multi-tooth socket SW 27 - 3357-



◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-



Note

*Gearbox oil specification; check the ⇒ Electronic Parts Catalog "ETKA".*

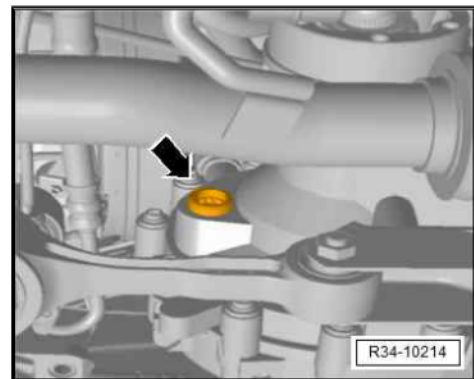
– Remove screw (plug) to check oil level -arrow-.



Note

*The oil level will be OK if the gearbox has oil up to the lower edge of the checking hole.*

– Install screw (plug) -arrow-.

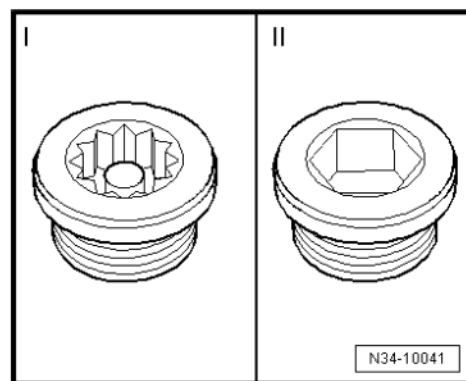




Bolt tightening torque (plug):

I - Bolt (toothed) = 24 Nm

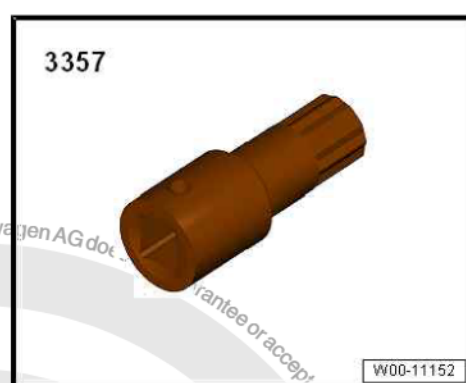
II - Bolt (hexagonal) = 32 Nm



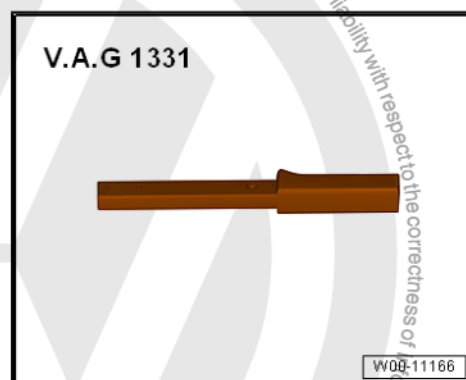
### 3.2 Oil level - replenish

Special tools and workshop equipment required

◆ Multi-tooth socket SW 27 - 3357-



◆ Torque wrench - 5 to 50 Nm (1/2" drive) - VAG 1331-



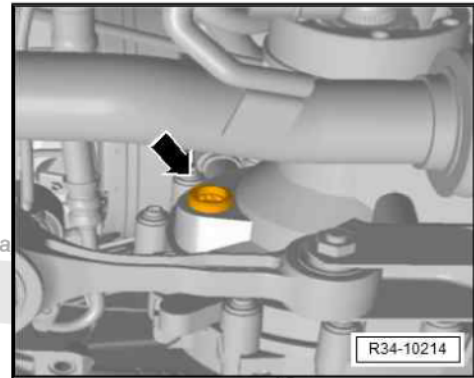
Note

Gearbox oil specification; check the *Electronic Parts Catalog* "ETKA".



To fill completely the reservoir with new oil:

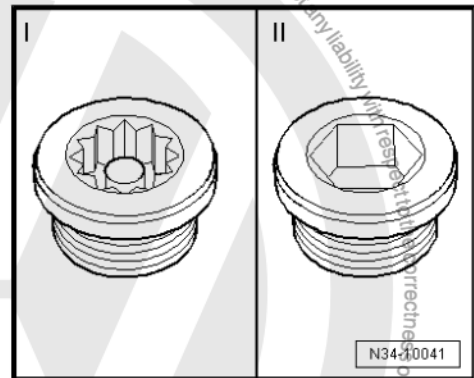
- Loosen screw (plug) -arrow-.
- Fill with the specified oil up to the lower edge of the checking hole.
- Install screw (plug) -arrow-.
- Start engine, engage a gear and let the gearbox functioning by approx. 2 minutes.
- Stop engine and replenish with oil up to the lower edge of the checking hole.
- Install screw (plug) -arrow-.



Bolt tightening torque (plug):

I - Bolt (toothed) = 24 Nm

II - Bolt (hexagonal) = 32 Nm







## 4 Transmission - repair

⇒ ["4.1 Gearbox - overview", page 107](#)

⇒ ["4.2 gearbox - assembly overview", page 108](#)

⇒ ["4.3 Gearbox housing cover and 5th gear", page 108](#)

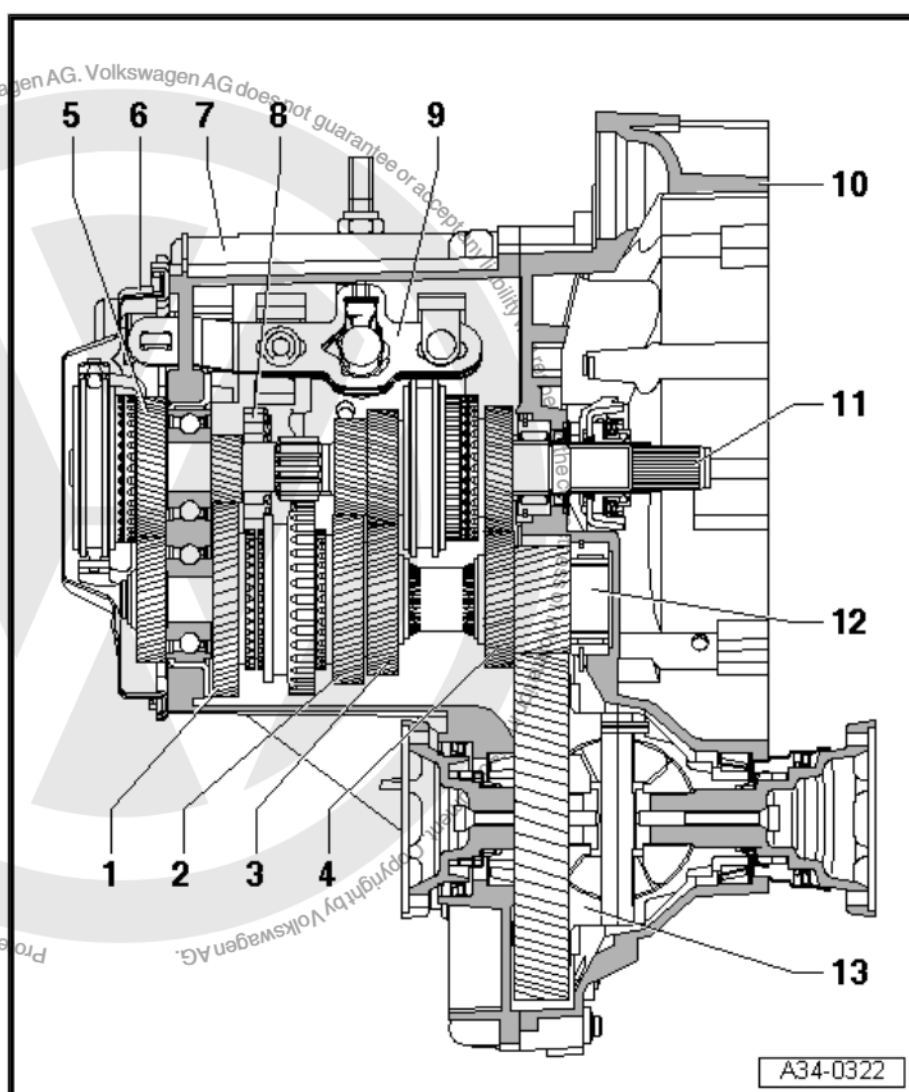
⇒ ["4.4 Clutch housing", page 110](#)

⇒ ["4.5 Input shaft, planet pinion, differential, selection mechanism and selector forks", page 111](#)

⇒ ["4.6 Input shaft, planet pinion, differential, selection mechanism and selector forks - disassemble and assemble", page 113](#)

### 4.1 Gearbox - overview

- 1 - 1st gear
- 2 - 2nd gear
- 3 - 3rd gear
- 4 - 4th gear
- 5 - 5th gear
- 6 - Gearbox housing cover
- 7 - Gearbox housing
- 8 - Reverse gear
- 9 - Selection mechanism
- 10 - Clutch housing
- 11 - Input shaft
- 12 - Output shaft/planet pinion
- 13 - Differential



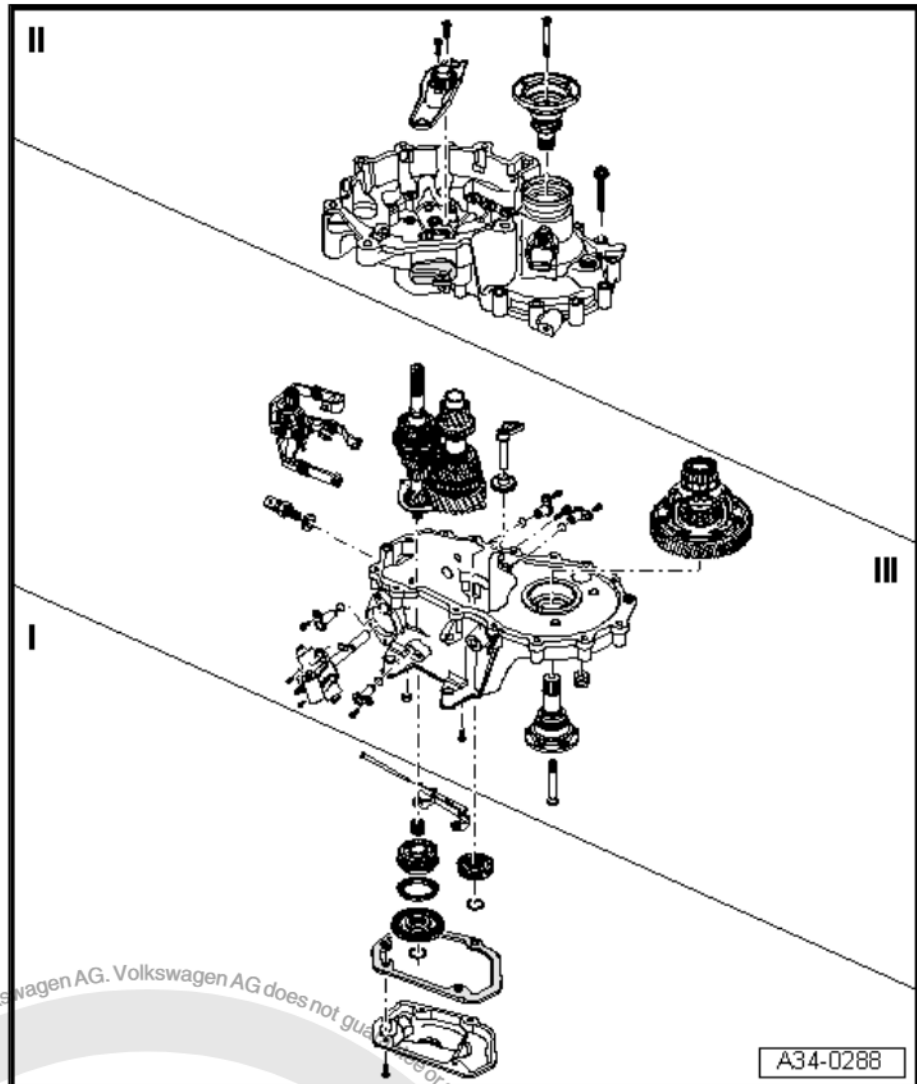


## 4.2 gearbox - assembly overview

I - Gearbox housing cover and 5th gear ➔ [page 108](#)

II - Clutch housing ➔ [page 110](#)

III - Input shaft, planet pinion, differential, selection mechanism and selector forks ➔ [page 111](#)



## 4.3 Gearbox housing cover and 5th gear



### WARNING

- ◆ When handling chemicals follow the safety instructions ➔ *Chemical Products Manual; Rep. gr. 00*
- ◆ Assignment of Chemical Materials ➔ *Electronic Parts Catalogue "ETKA"*



## 1 - Gearbox housing

- ☐ Assignment ⇒ Electronic Parts Catalogue "ET-KA" .
- ☐ Repair ⇒ [page 121](#)
- ☐ Apply Sealing compound - AMV 188 200 03 - evenly on the sealing surface.
- ☐ In case of replacement, always adjust differential ⇒ [page 173](#)

## 2 - 5th gear wheel

- ☐ Installation position ⇒ [page 120](#)

## 3 - Circlip

- ☐ Replace after each removal.
- ☐ Determine thickness ⇒ [page 120](#)

## 4 - Gasket

- ☐ Replace if damaged

## 5 - Gearbox housing cover

- ☐ When installing the cover on a gearbox installed, check and replenish the oil level ⇒ [page 104](#) .

## 6 - Bolts

- ☐ 5 Nm + 90°
- ☐ Replace after each removal.

## 7 - Circlip

- ☐ Replace after each removal.
- ☐ Determine thickness ⇒ [page 120](#)

## 8 - Synchronizer with engaging sleeve and stop ring for 5th gear

- ☐ Disassemble and assemble ⇒ [page 136](#)

## 9 - Synchronizer ring for 5th gear

## 10 - Selection wheel for 5th gear

- ☐ Installation position for 5th gear wheel ⇒ [page 120](#)

## 11 - Needle bearing

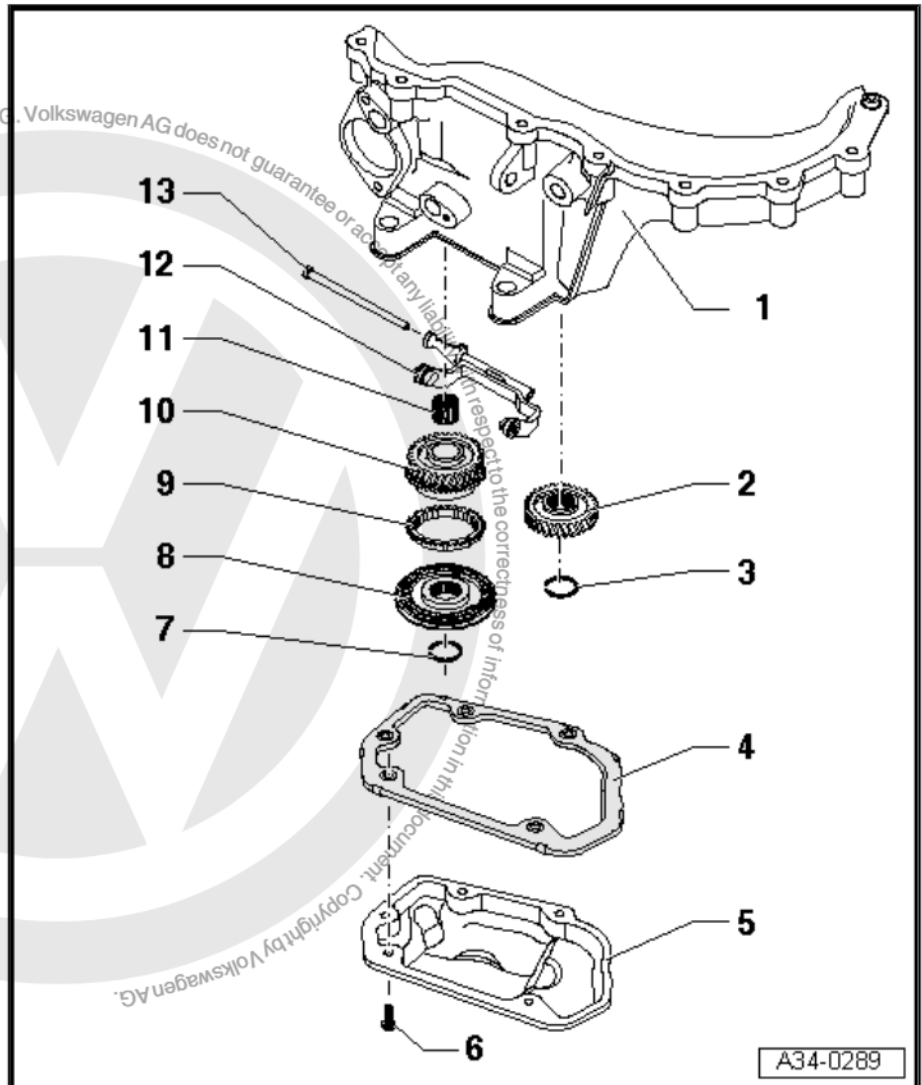
- ☐ For 5th gear

## 12 - Selector fork for 5th gear

- ☐ Disassemble and assemble ⇒ [page 131](#)

## 13 - Bearing pin

- ☐ For 5th gear selector fork





## 4.4 Clutch housing



### WARNING

- ◆ When handling chemicals follow the safety instructions ⇒ *Chemical Products Manual; Rep. gr. 00*
- ◆ Assignment of Chemical Materials ⇒ *Electronic Parts Catalogue "ETKA"*

#### 1 - Countersunk bolt

- 25 Nm

#### 2 - Drive flange with pressure spring

#### 3 - Bolt

- 5 Nm + 90°
- Replace after each removal.

#### 4 - Clutch housing

- Assignment ⇒ *Electronic Parts Catalogue "ETKA"*.
- Repair ⇒ [page 121](#)
- Apply Sealing compound - AMV 188 200 03- evenly on the sealing surface.
- In case of replacement, always adjust differential ⇒ [page 173](#)

#### 5 - Gearbox housing

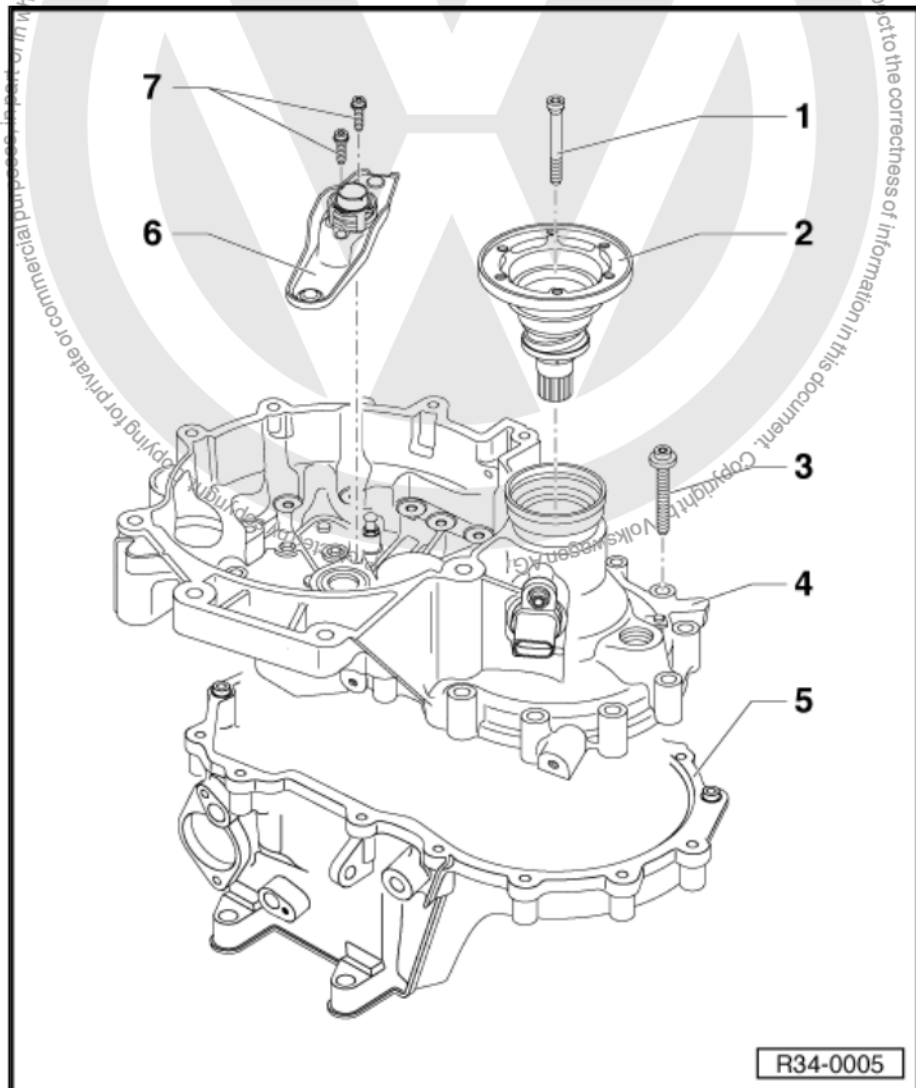
- Assignment ⇒ *Electronic Parts Catalogue "ETKA"*.
- Repair ⇒ [page 121](#)
- Apply Sealing compound - AMV 188 200 03- evenly on the sealing surface.
- In case of replacement, always adjust differential ⇒ [page 173](#)

#### 6 - Clutch lever

- Remove and install with the roller bearing guide and clutch roller bearing

#### 7 - Bolts

- 5 Nm + 90°
- Replace after each removal.





## 4.5 Input shaft, planet pinion, differential, selection mechanism and selector forks



### WARNING

- ◆ When handling chemicals follow the safety instructions ⇒ *Chemical Products Manual; Rep. gr. 00*
- ◆ Assignment of Chemical Materials ⇒ *Electronic Parts Catalogue "ETKA"*

#### 1 - Differential

- ☐ Disassemble and assemble ⇒ [page 164](#)

#### 2 - Gearbox housing

- ☐ Assignment ⇒ *Electronic Parts Catalogue "ETKA"*.
- ☐ Repair ⇒ [page 121](#)
- ☐ Apply Sealing compound - AMV 188 200 03- evenly on the sealing surface.
- ☐ In case of replacement, always adjust differential ⇒ [page 173](#)

#### 3 - Oil draining screw (plug)

- ☐ Screw with inner multi-tooth = 24 Nm
- ☐ Screw with inner hex = 32 Nm

#### 4 - Drive flange

#### 5 - Countersunk bolt

- ☐ 25 Nm

#### 6 - Bolts

- ☐ 5 Nm + 90°
- ☐ Replace after each removal.
- ☐ For fastening the ball bearing support on the primary drive and pinion ⇒ [Item 16 \(page 112\)](#)

#### 7 - Hexagonal nut

- ☐ 23 Nm
- ☐ For the selection mechanism ⇒ [Item 15 \(page 112\)](#)

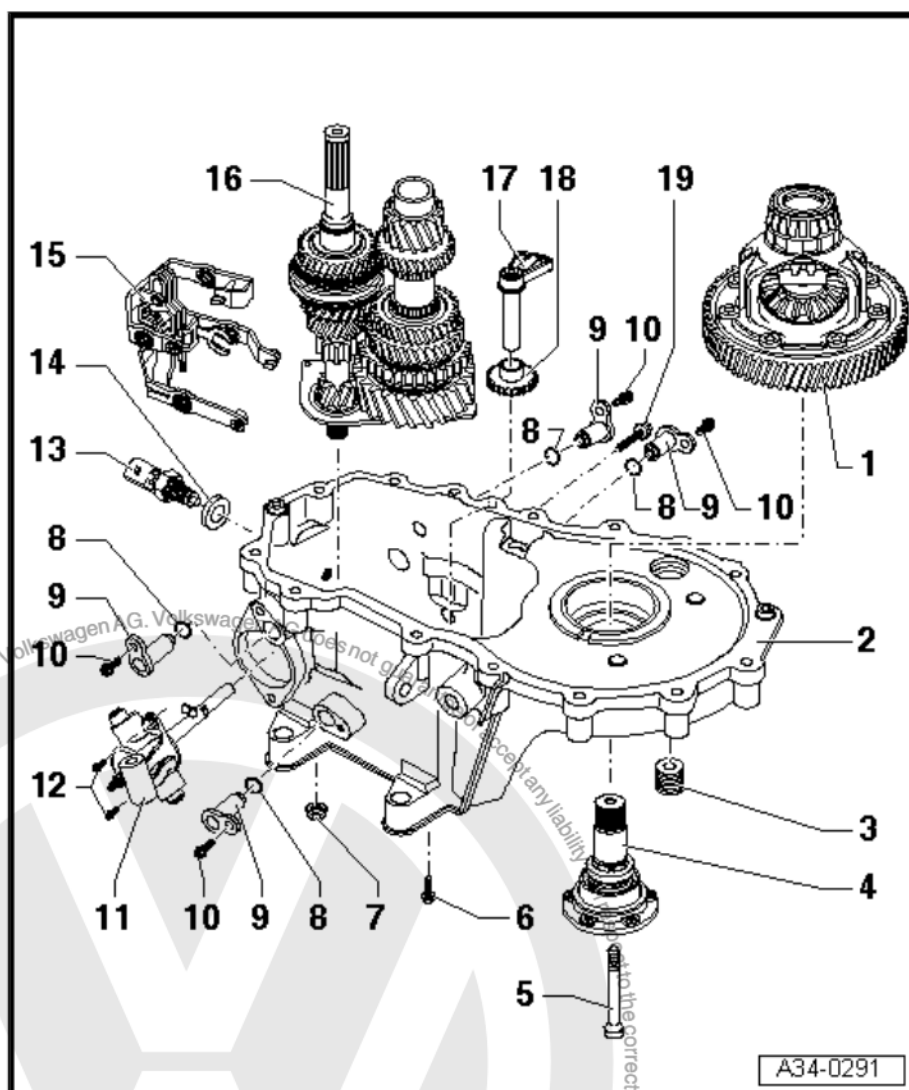
#### 8 - O-ring

- ☐ Replace after each removal.

#### 9 - Bearing pin

#### 10 - Bolts

- ☐ 5 Nm + 90°
- ☐ Replace after each removal.







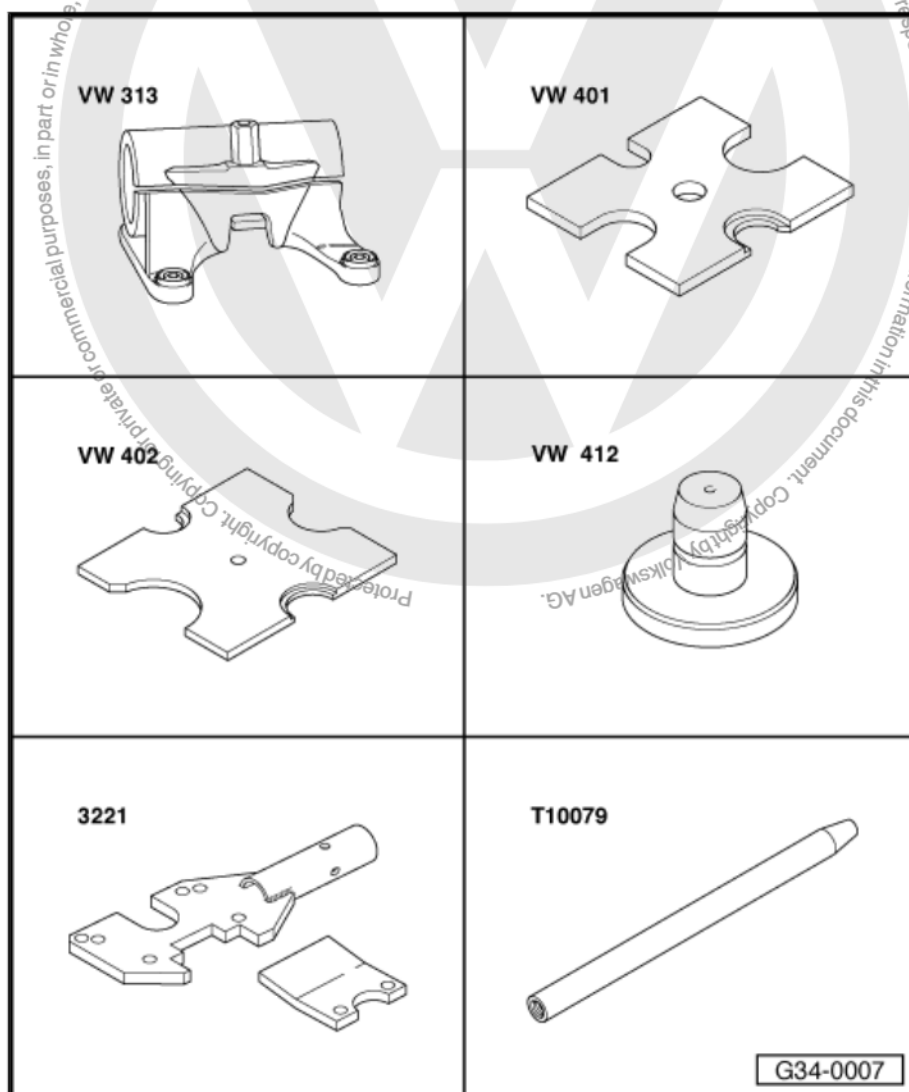
- 11 - Selector lever shaft with selection mechanism cover
- ☐ Disassemble and assemble ⇒ [page 127](#)
  - ☐ Apply Sealing compound - AMV 188 200 03- evenly on the sealing surface.
- 12 - Bolts
- ☐ 5 Nm + 90°
  - ☐ Replace after each removal.
- 13 - Reversing light switch - F4-
- ☐ 20 ± 2 Nm
- 14 - Sealing ring
- ☐ Only used in some gearbox housings
  - ☐ If applicable, replace on installation
- 15 - Selection mechanism
- ☐ Selector forks
  - ☐ Disassemble and assemble ⇒ [page 131](#)
- 16 - Input shaft and planet pinion with ball bearing support
- ☐ Clean the threaded holes of the roller bearing support (e.g. Tap M6)
  - ☐ Removing the roller bearing support ⇒ [page 142](#)
  - ☐ Disassemble and assemble the input shaft ⇒ [page 136](#)
  - ☐ Disassemble and assemble the planet pinion ⇒ [page 148](#)
- 17 - Reverse gear intermediate shaft
- 18 - Reverse gear
- 19 - Bolt
- ☐ For reverse gear intermediate shaft
  - ☐ M6 = 5 Nm + 90°
  - ☐ M8 = 25 Nm + 90°
  - ☐ Replace after each removal.



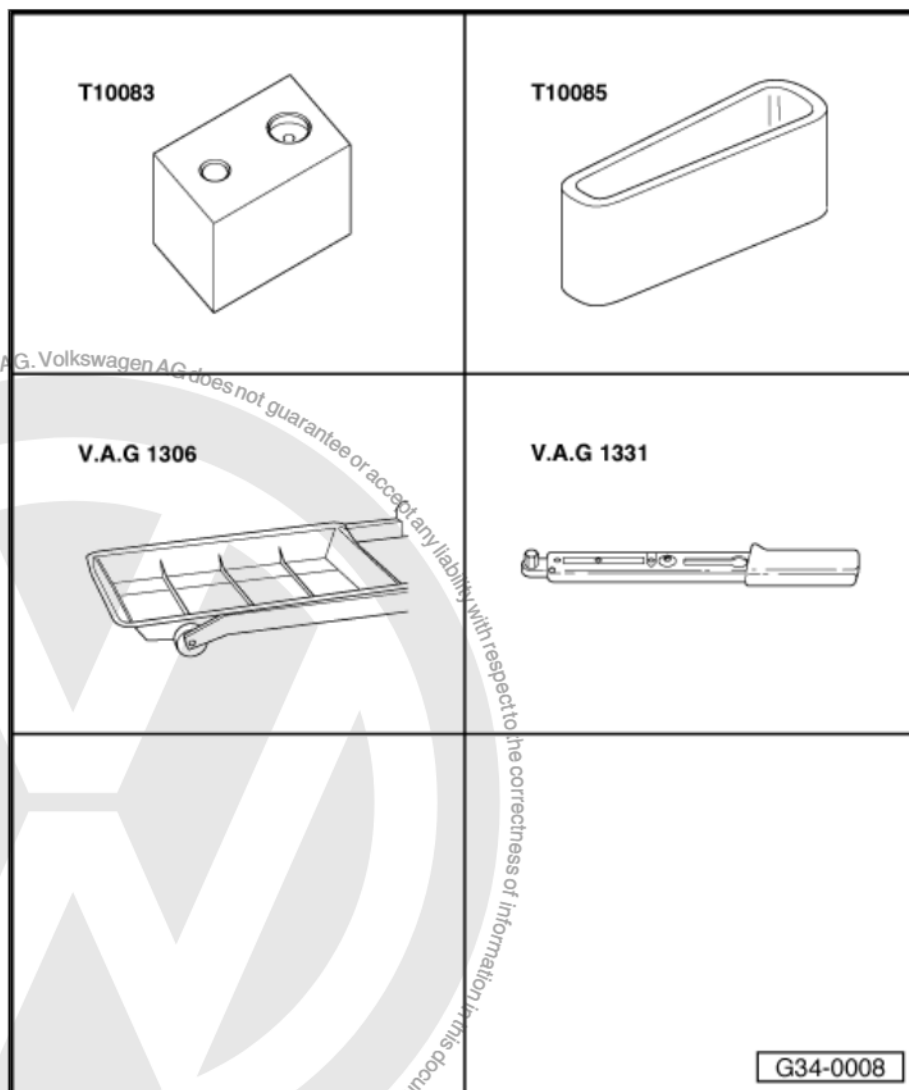


## 4.6 Input shaft, planet pinion, differential, selection mechanism and selector forks - disassemble and assemble

Special tools and workshop equipment required



- ◆ Support for VW643 or VW 643/1 - VW 313- or Rotary stand for engine and gearbox - VAS 6095-
- ◆ Plate - VW 401-
- ◆ Plate - VW 402-
- ◆ Pressure disc - VW 412-
- ◆ Mounting bracket - 3221-
- ◆ Guide pin - T 10079-



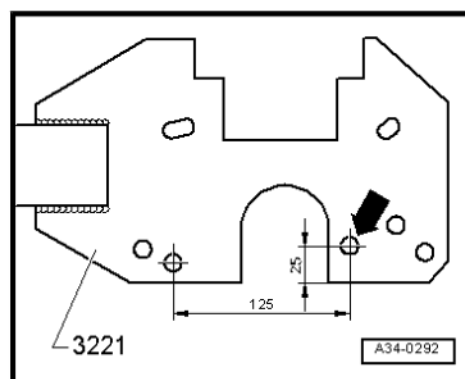
- ◆ Pressure shim - T 10083-
- ◆ Pressure shim - T 10080-
- ◆ Oil collecting tray - VAG 1306-
- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-

Modify the bearing of the Support - 3221-

A new hole is required to fasten the mechanical gearbox (02T and 0AP) to the gearbox support.

Dimensions in mm:

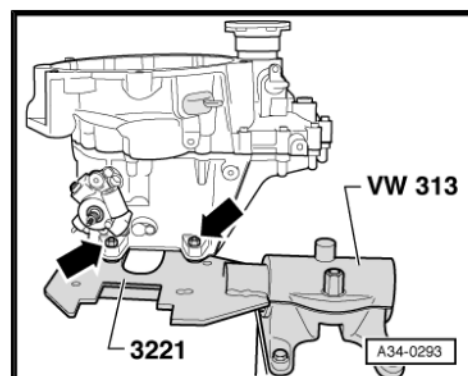
- Make a bore of Ø 11.0 mm -arrow- on the Support - 3221- .



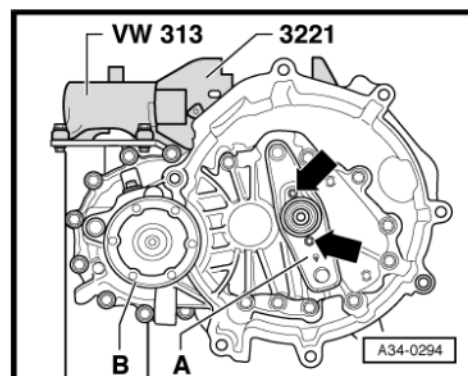


## 4.6.1 Disassembly

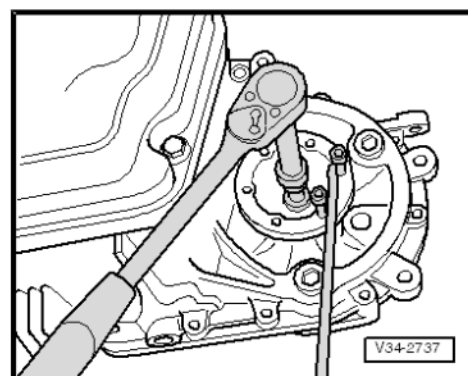
- Fasten the gearbox on the Support for VW643 or VW 643/1 - VW 313- or Rotary stand for engine and gearbox - VAS 6095- -arrows- as indicated.
- Place the Oil collector - VAG 1306- under the gearbox.
- Drain the gear oil.



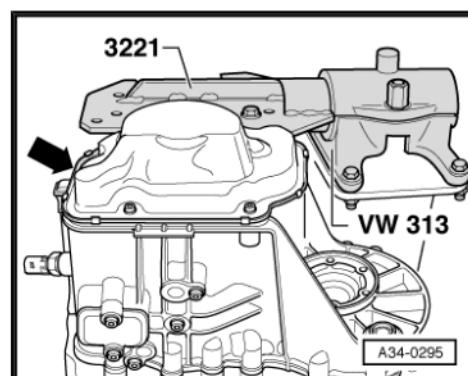
- Remove clutch lever -A- with the clutch bearing and bearing guide -arrows-.



- Remove the drive flange fastening screw on right side -B-, by using two screws to lock the flange with a lever.  
Remove drive flange.

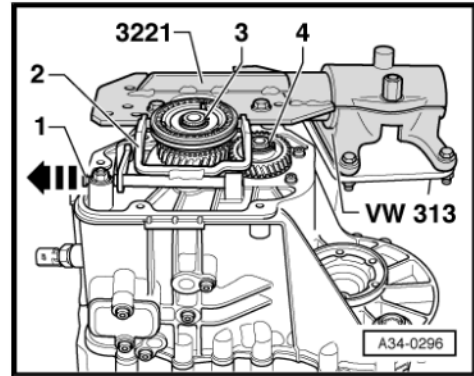


- Remove the transmission housing cover -arrow-.

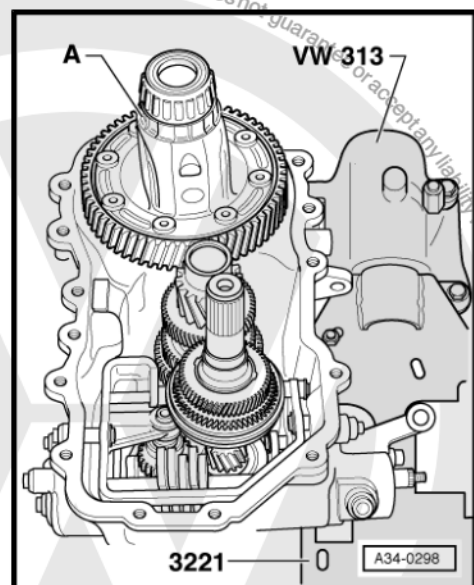
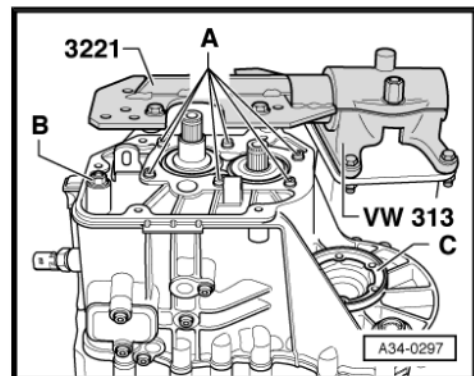




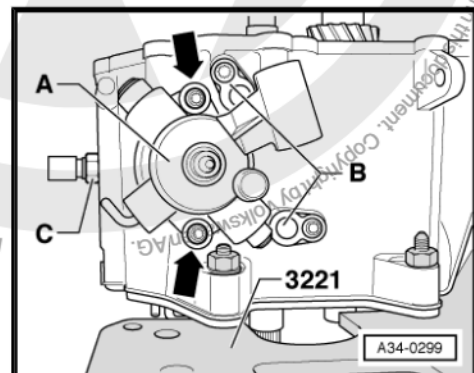
- Remove pin -1- on the 5th gear selector fork bearing -2- and remove the selector fork.
- Remove circlip -3- and remove the 5th gear synchronizer.
- Remove circlip -4- and remove the 5th gear wheel.



- Remove the fastening screws -A- from the primary and planet pinion bearings.
- Remove the hex nut -B- from the selection mechanism (reverse gear fastening).
- Remove the drive flange fastening screw on left side -C-, by using two screws to lock the flange with a lever.
- Remove drive flange.
- Place the gearbox with the clutch housing facing upwards.
- Remove the fastening screws from the clutch housing.
- Remove the clutch housing carefully by leveraging via shoulders around the whole case alternately, without damaging the sealing surfaces.
- Remove differential -A- from the transmission housing.



- Remove fastening screws -arrows- and remove the selector lever shaft with the selector cover -A-, placing the selector lever shaft in the "neutral".
- Remove bearing pins -B- from the upper gearbox part.
- Remove the reverse gear light switch - F4- -C-.





- Remove screw -A- that fastens the reverse gear wheel shaft.
- Remove bearing pins -B- from the lower gearbox part.



Note

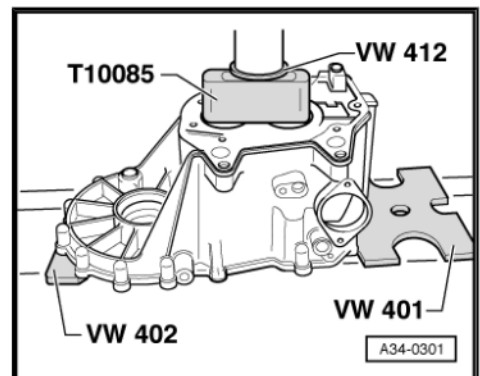
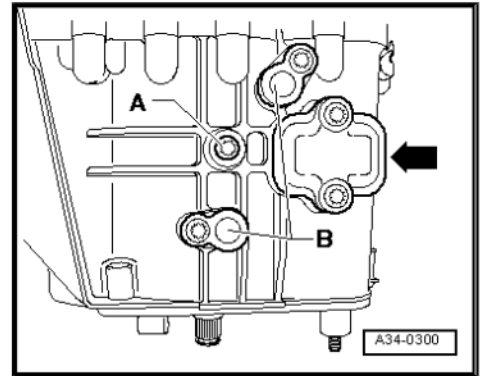
*Do not remove the cover cap -arrow- to disassemble the transmission.*

- Install the gearbox housing over the Plate - VW 401- and Plate - VW 402- , in order that the case adjustment pins are not damaged.
- Remove primary and planet pinions simultaneously from the roller bearing support, with the selection mechanism (selector fork) and the reverse gear wheel.



Note

*During pressing, make sure the parts do not fall; if required, ask for help from a second mechanic.*



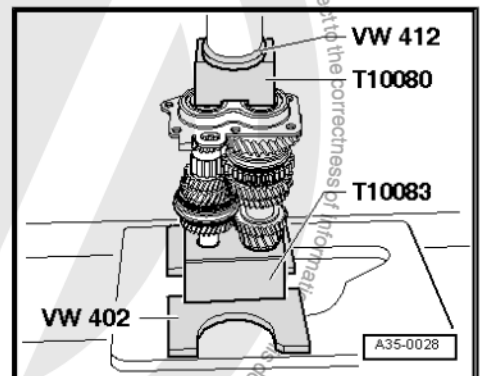
#### 4.6.2 Assembly



##### WARNING

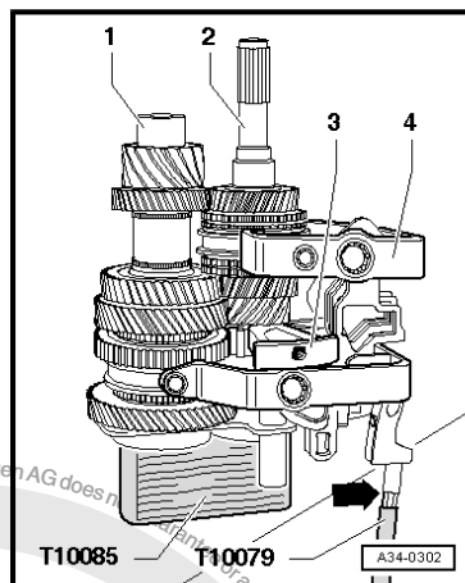
- ◆ *When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00*
- ◆ *Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"*

- Simultaneously install the primary drive shaft and the pinion on the bearing support using the Pressure shim - T 10083- and Pressure shim - T 10080- .

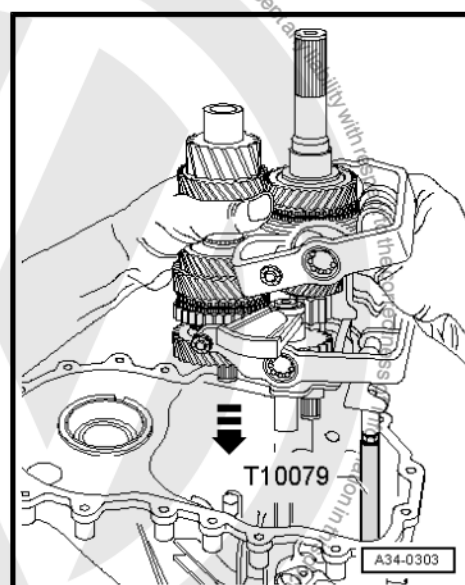




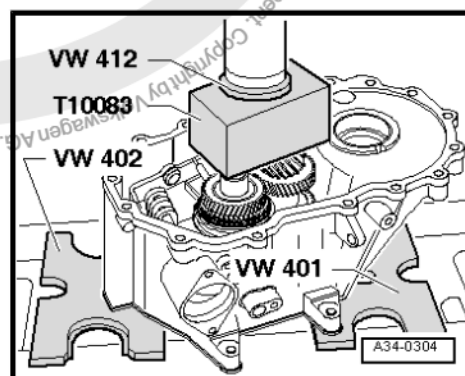
- Install input shaft -2-, and planet pinion -1- with the bearing/ ball bearing mounting on the Pressure base - T 10085-
- Install the selection mechanism (selector forks) -4- on the shaft engaging sleeves.
- Install the reverse gear wheel shaft -3- with gear.
- Install Guide pin - T 10079- on threaded pin (reverse gear fastening) -arrow-



- Install all the components in the gearbox case, by directing the Guide pin - T 10079- into the case through the gearshift mechanism's supporting hole.
- Remove the Guide pin - T 10079- .
- Before pressing on the roller bearing mounting, check the correct fitting of the selector forks on the gearing sleeves.



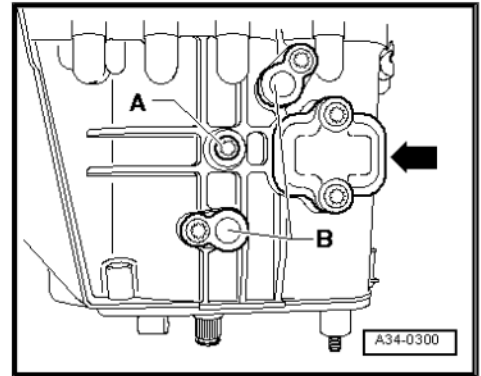
- Press carefully the roller bearing support with the primary and planet pinions to the stop.



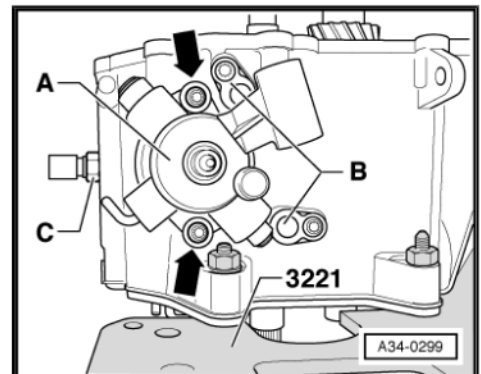




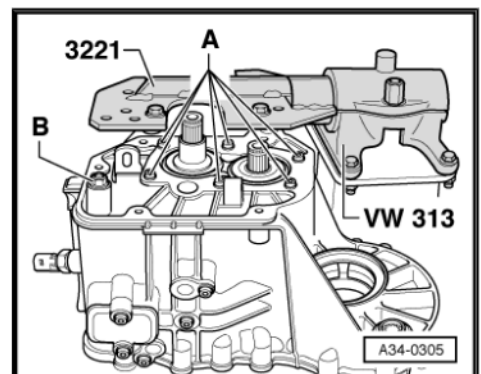
- Install screw -A- on the reverse gear wheel shaft.
- Install bearing pins -B- on the lower transmission part.



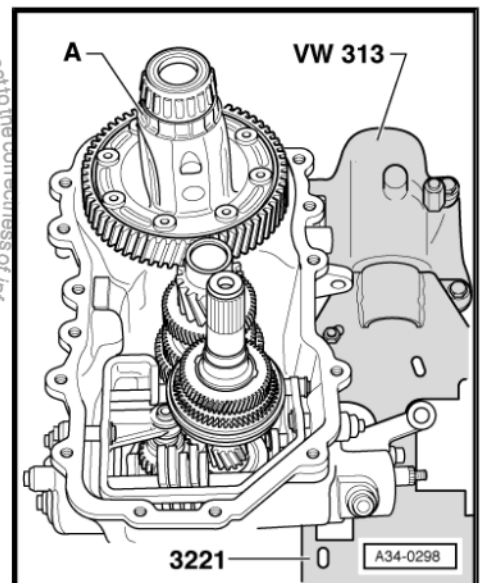
- Install the reverse gear light switch - F4- -C-.
- Install the bearing pins -B- in the upper gearbox part.
- Place the selector in the "dead centre" position.
- Apply Sealing compound - AMV 188 200 03- evenly on the selector cover's surface.
- Install the selector lever shaft with the selector cover -A- and tighten the screws -arrows-. Tightening torque, see [⇒ Item 12 \(page 112\)](#).



- Install bearing supports on the primary and planet pinions by using new screws -A- tightening in cross and phased pattern, starting by the middle.
- Install hex nut -B- for the selection mechanism (selector forks).



- Install differential -A-.
- Apply Sealing compound - AMV 188 200 03- evenly on the sealing surface of the transmission housing.
- Install the clutch housing on the gearbox housing and tighten screws to the specified tightening torque [⇒ Item 3 \(page 110\)](#).
- Place the gearbox with the clutch housing facing upwards.
- Install the 5th gear wheel -1- with the needle bearing.

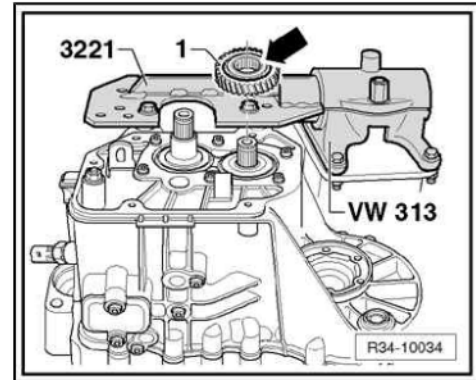




### Installation position for 5th gear wheel

The wide collar -arrow- should point to the gearbox housing cover.

- Install the 5th gear synchronizer ring on the wheel.
- Install the complete 5th gear synchronizer with the gearing sleeve and stop ring.

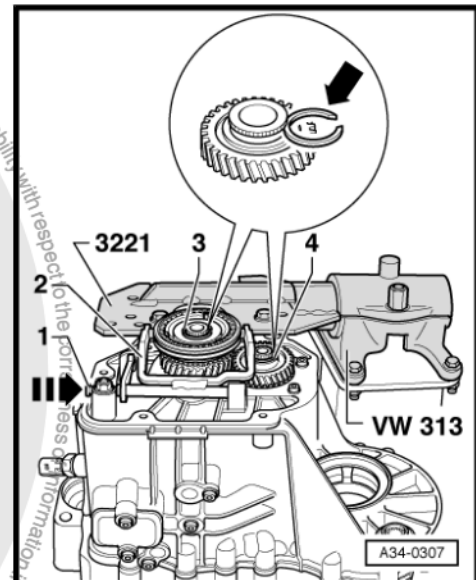


- Install the 5th gear selector fork -2- and push the bearing pin -1- to the stop, towards -arrow-.
- Determine the new circlip thickness -arrow-.
- Identify and install circlip on the primary -3- and pinion -4- shafts.

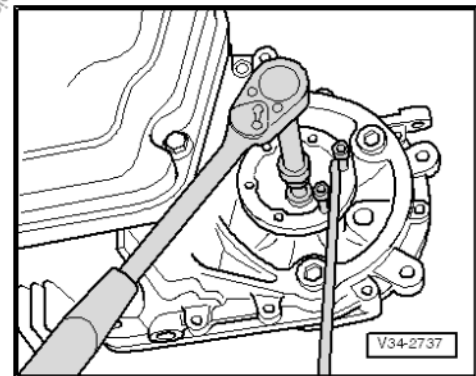
### Available circlips

Thickness (mm)	Replacement parts No.
2.00	-085 311 187-
2.10	-085 311 187 A-
2.20	-085 311 187 B-

- Install the gearbox housing cover.



- Install drive flanges.
- Install clutch lever with bearing and bearing guide ➔ [page 40](#).
- Fill with gear oil ➔ [page 104](#).



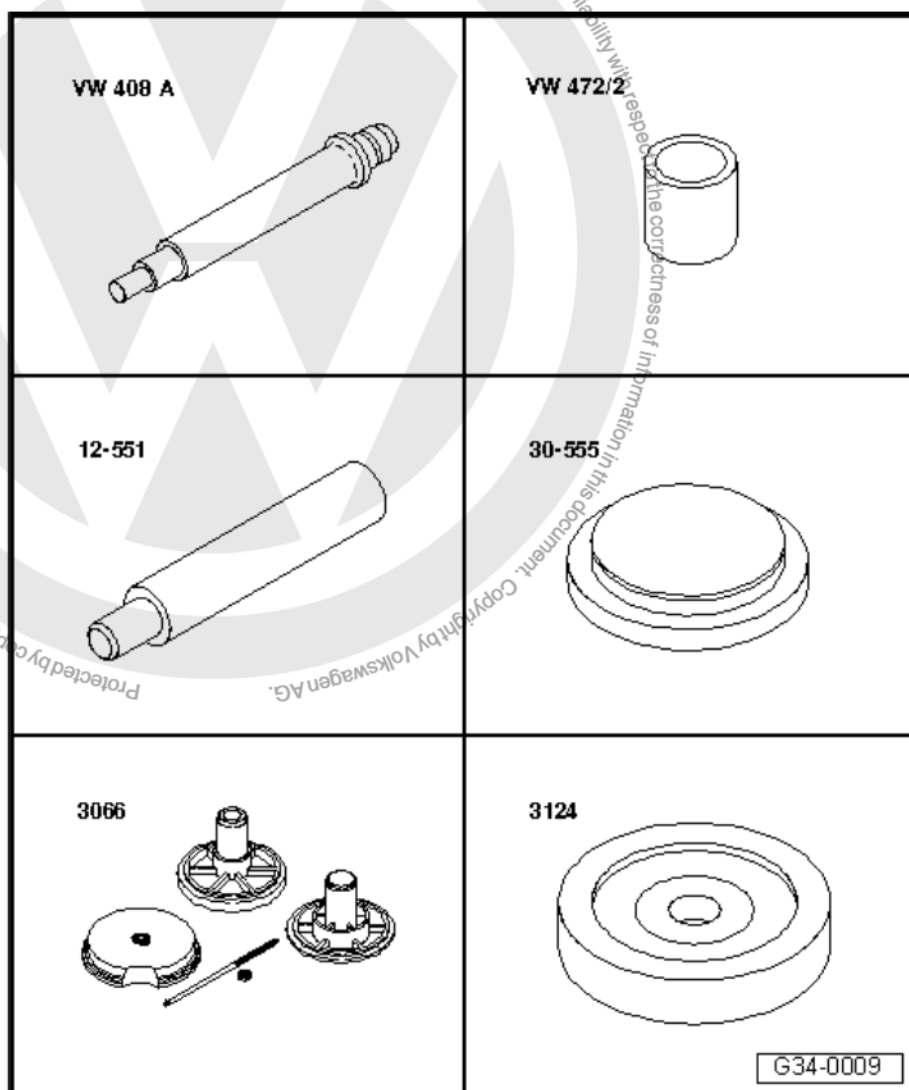


## 5 Gearbox and clutch housings

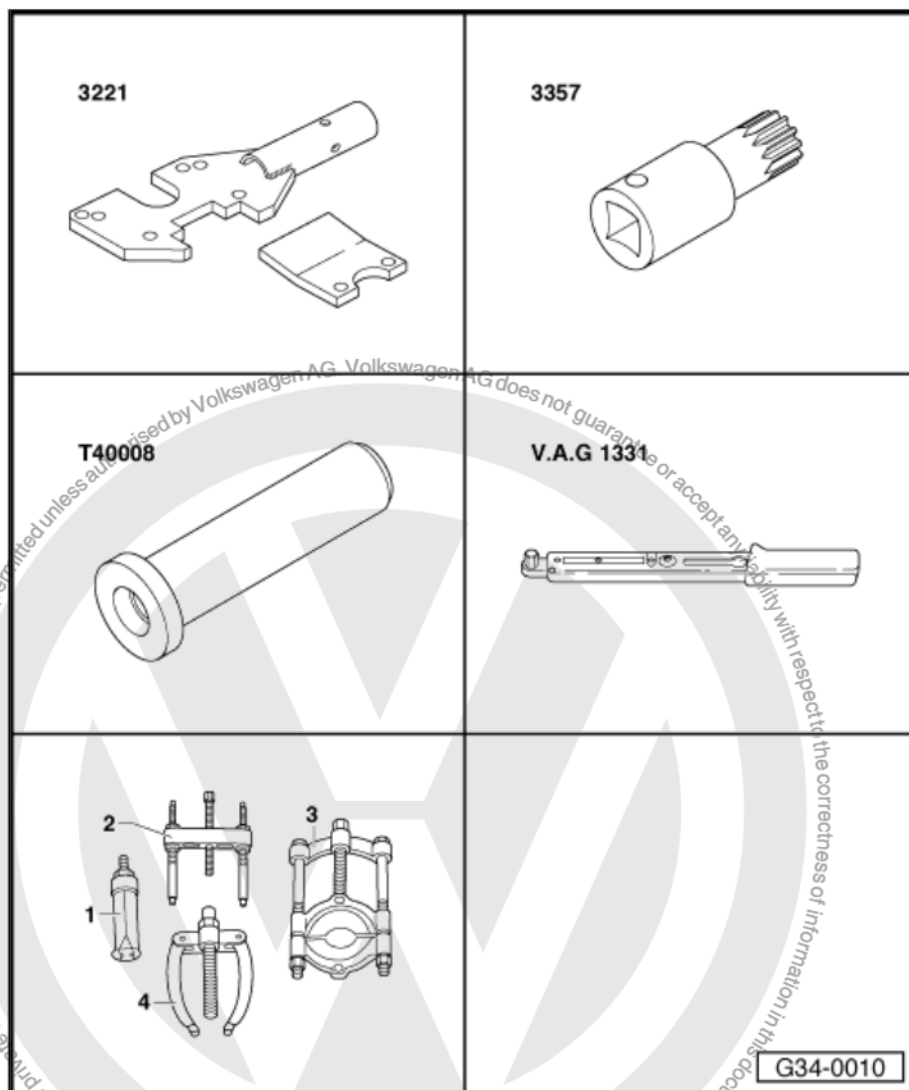
⇒ ["5.1 Transmission and clutch housings - repair", page 121](#)

### 5.1 Transmission and clutch housings - repair

Special tools and workshop  
equipment required



- ◆ Pressure pin - VW 408A-
- ◆ Sleeve - VW 472/2-
- ◆ Centring pin - 12-551-
- ◆ Pressure disc - 30-555-
- ◆ Assembly device - 3066-
- ◆ Pressure plate - 3124-



- ◆ Mounting bracket - 3221-
- ◆ Multi-tooth socket SW 27 - 3357-
- ◆ Pressure tube - T 40008-
- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-
- ◆ -2- Puller 65 - 160 mm - KUKKO 18/1-
- ◆ -3- Spacer 12 - 75 mm - KUKKO 17/1-



**WARNING**

- ◆ *When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00*
- ◆ *Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"*



## 1 - Clutch housing

- ☐ Assignment ⇒ Electronic Parts Catalogue "ET-KA"
- ☐ Apply Sealing compound - AMV 188 200 03- evenly on the sealing surface.
- ☐ Repair ⇒ [page 121](#)
- ☐ In case of replacement, always adjust differential ⇒ [page 173](#)

## 2 - Sealing ring for input shaft

- ☐ Remove by leveraging with screwdriver.
- ☐ Installation ⇒ [page 125](#)

## 3 - Ball pin

- ☐ 20 Nm
- ☐ Lubricate with Lubricating grease - G 000 100-

## 4 - Sealing ring for the right drive flange

- ☐ Replace with the gear-box installed  
⇒ [page 167](#)

## 5 - Bushing

- ☐ For the sealing ring
- ☐ Removal ⇒ [page 125](#)
- ☐ Installation ⇒ [page 125](#)

## 6 - Oil filling screw (plug)

- ☐ Screw with inner multi-tooth = 24 Nm
- ☐ Screw with inner hex = 32 Nm

## 7 - O-ring

- ☐ Replace after each removal.

## 8 - Speed sensor - G22-

## 9 - Bolt

- ☐ 5 Nm + 90°
- ☐ Replace after each removal.

## 10 - Adjustment shim S<sub>2</sub>

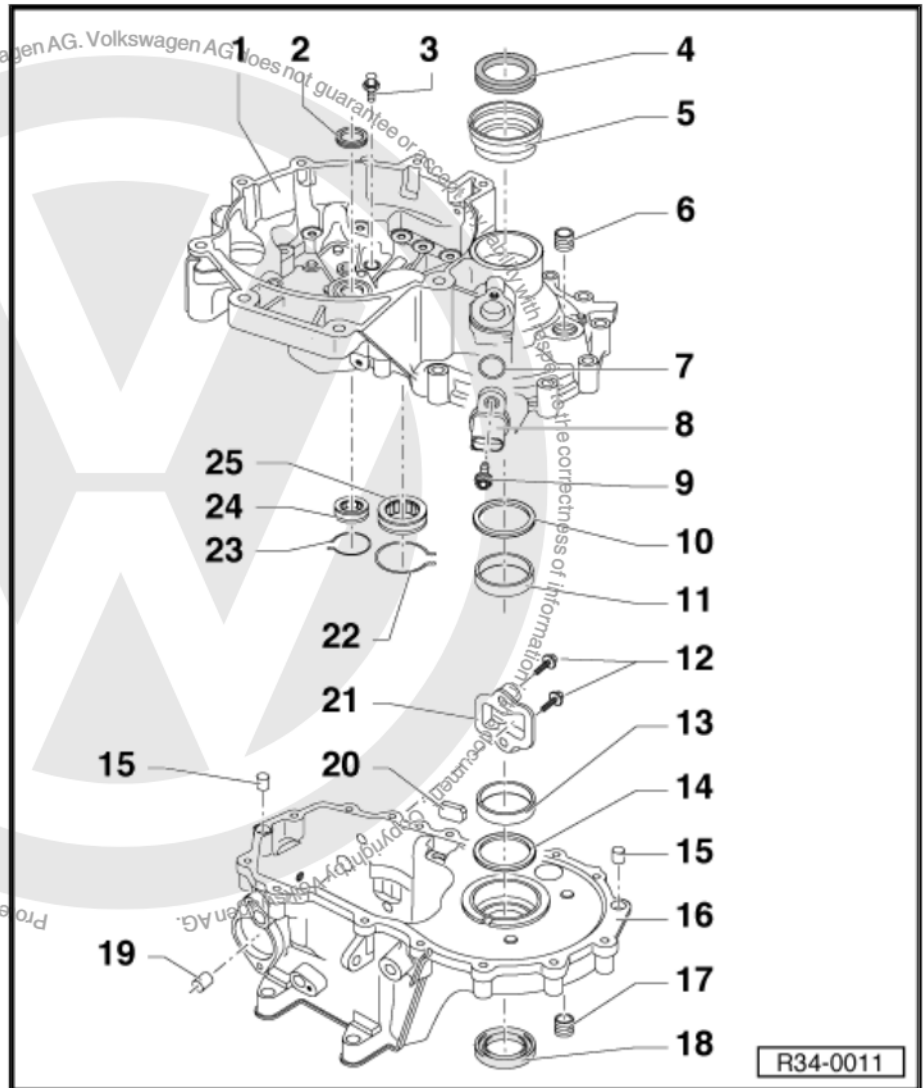
- ☐ For the differential
- ☐ Determine thickness ⇒ [page 173](#)

## 11 - Outer ring on the tapered roller bearing

- ☐ For the differential
- ☐ Remove ⇒ [page 171](#)
- ☐ Install ⇒ [page 171](#)
- ☐ If replaced, always adjust differential ⇒ [page 173](#) .

## 12 - Bolt

- ☐ 5 Nm + 90°
- ☐ Replace after every removal







### 13 - Outer ring on the tapered roller bearing

- ☐ For the differential
- ☐ Remove ⇒ [page 170](#)
- ☐ Install ⇒ [page 171](#)
- ☐ If replaced, always adjust differential ⇒ [page 173](#) .

### 14 - Adjustment shim S<sub>1</sub>

- ☐ For the differential
- ☐ Always with 1-mm thickness



#### Note

*Only used on gearbox housings  
-02T.301.103.L- and -02T.  
301.103.AA-*

### 15 - Adjustment pin

- ☐ 2 units

### 16 - Gearbox housing

- ☐ Assignment ⇒ Electronic Parts Catalogue "ETKA"
- ☐ Apply Sealing compound - AMV 188 200 03- evenly over the sealing surface of the gearbox housing.
- ☐ Repair ⇒ [page 121](#)
- ☐ In case of replacement, always adjust differential ⇒ [page 173](#)

### 17 - Oil draining screw (plug)

- ☐ Screw with inner multi-tooth = 24 Nm
- ☐ Screw with inner hex = 32 Nm

### 18 - Sealing ring for the left drive flange

- ☐ Replace with the gearbox installed ⇒ [page 157](#)

### 19 - Bushing

- ☐ For the selector lever shaft
- ☐ Removal ⇒ [page 125](#)
- ☐ Installation ⇒ [page 126](#)

### 20 - Magnet

- ☐ fastened on the case surface

### 21 - Reservoir cap

- ☐ Apply Sealing compound - AMV 188 200 03- evenly on the sealing surface before installing.

### 22 - Circlip

- ☐ Install on the tapered roller bearing groove ⇒ [Item 25 \(page 124\)](#) -

### 23 - Circlip

- ☐ Install on the tapered roller bearing groove ⇒ [Item 24 \(page 124\)](#) -

### 24 - Tapered roller bearing

- ☐ For input shaft
- ☐ Removal ⇒ [page 142](#)
- ☐ Installation ⇒ [page 142](#)

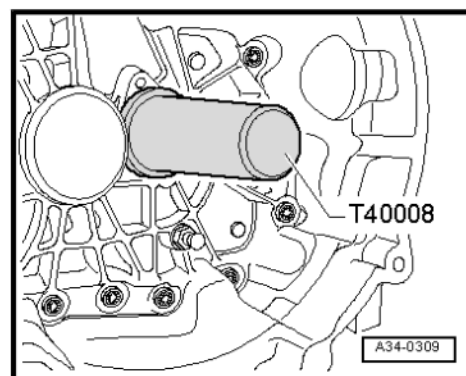
### 25 - Tapered roller bearing

- ☐ For planet pinion
- ☐ Removal ⇒ [page 152](#)
- ☐ Installation ⇒ [page 152](#)





## Installing the input shaft's sealing ring

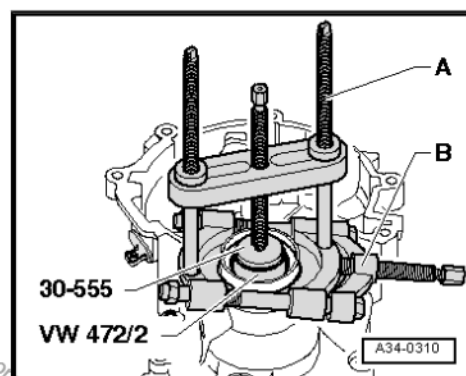


## Removing the sealing ring bushing

- Sleeve - VW 472/2- and Pressure disc - 30-555- , install on the differential.

A - Puller 65 - 160 mm - KUKKO 18/1-

B - Spacer 12 - 75 mm - KUKKO 17/1-



## Installing the sealing ring bushing

A - Fasten the threaded shaft of the Assembly tool - 3066- to the threaded part in the differential

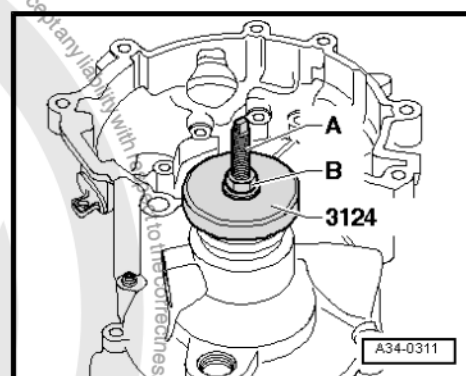
B - M12 nut with washer

- Install the bushing to the stop with Thrust plate - 3124- by turning nut -B-.

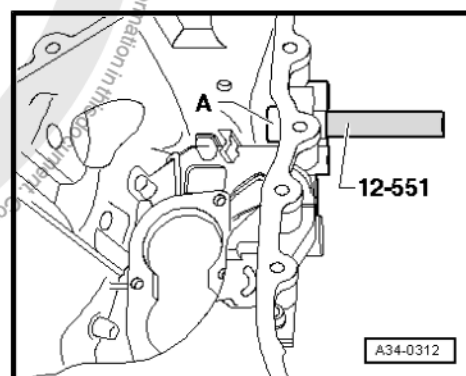


### Note

*With the gearbox disassembled, press the bushing with Thrust plate - 3124- to the stop.*

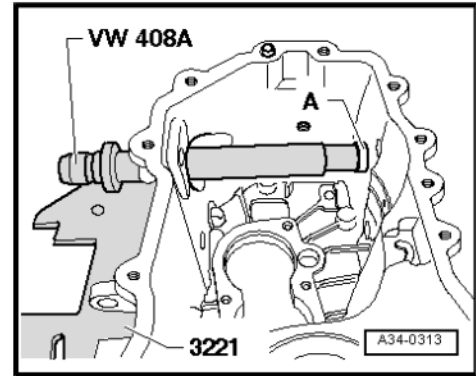


## Removing the bushing for the selector lever shaft -A-





Installing the bushing for the selector lever shaft -A-





## 6 Gear selection mechanism - adjust

⇒ ["6.1 Gear selection mechanism - disassemble and assemble", page 127](#)

### 6.1 Gear selection mechanism - disassemble and assemble



#### WARNING

- ◆ *When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00*
- ◆ *Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"*

Special tools and workshop equipment required

- ◆ Pressure tube - VW 423-

VW 423



W00-11136

- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-

V.A.G 1331



W00-11166



#### Note

- ◆ *Lubricate supporting points and sliding surfaces with Lubrication grease - G 000 450 02- .*
- ◆ *Assignment ⇒ Electronic Parts Catalogue "ETKA"*

Assembly overview (version 1 and 2):



1 - Bushing

- ☐ For the selector lever shaft
- ☐ Remove ➔ [page 125](#)
- ☐ Install ➔ [page 126](#)

2 - Selector lever shaft with selector cover

- ☐ Replace as a set

3 - Inversion lever

- ☐ Lubricate with Lubricating grease - G 000 450 02- .
- ☐ Installation position ➔ [page 47](#)

4 - Bearing bushes

- ☐ Lubricate with Lubricating grease - G 000 450 02- .

5 - Circlip

6 - Cap

- ☐ For the gearbox venting tube

7 - Seal

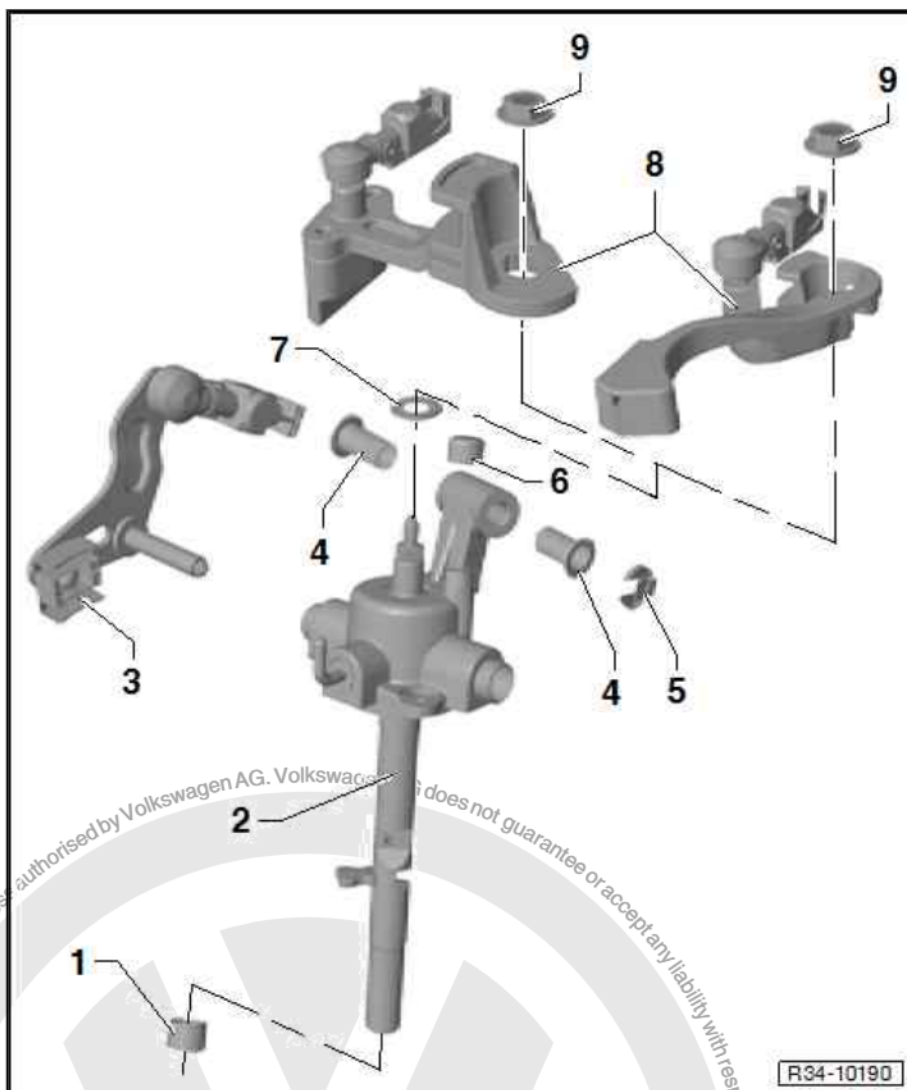
- ☐ Remove by using a screwdriver
- ☐ Install ➔ [page 130](#)

8 - Gearbox selector lever

- ☐ Install in order that the grooves are aligned with those on the selector lever shaft
- ☐ It can be replaced with the selection mechanism installed
- ☐ Assignment ➔ Electronic Parts Catalogue "ETKA"
- ☐ Installation position ➔ [page 47](#)

9 - Hexagonal nut

- ☐ Self-locking
- ☐  $20 \pm 2$  Nm
- ☐ Replace after every removal



Note

- ◆ Lubricate supporting points and sliding surfaces with Lubrication grease - G 000 450 02- .
- ◆ Assignment ➔ Electronic Parts Catalogue "ETKA"



Assembly overview (version 3):



# WARNING

- ◆ *When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00*
- ◆ *Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"*

## 1 - Bushing

- ☐ For the selector lever shaft
- ☐ Remove ⇒ [page 125](#)
- ☐ Install ⇒ [page 126](#)

## 2 - Selector lever shaft with selector cover

- ☐ Replace as a set

## 3 - Inversion lever

- ☐ Installation position ⇒ [page 47](#)
- ☐ Lubricate with Lubricating grease - G 000 450 02-

## 4 - Plastic lock

## 5 - Cap

- ☐ For the gearbox venting tube

## 6 - Seal

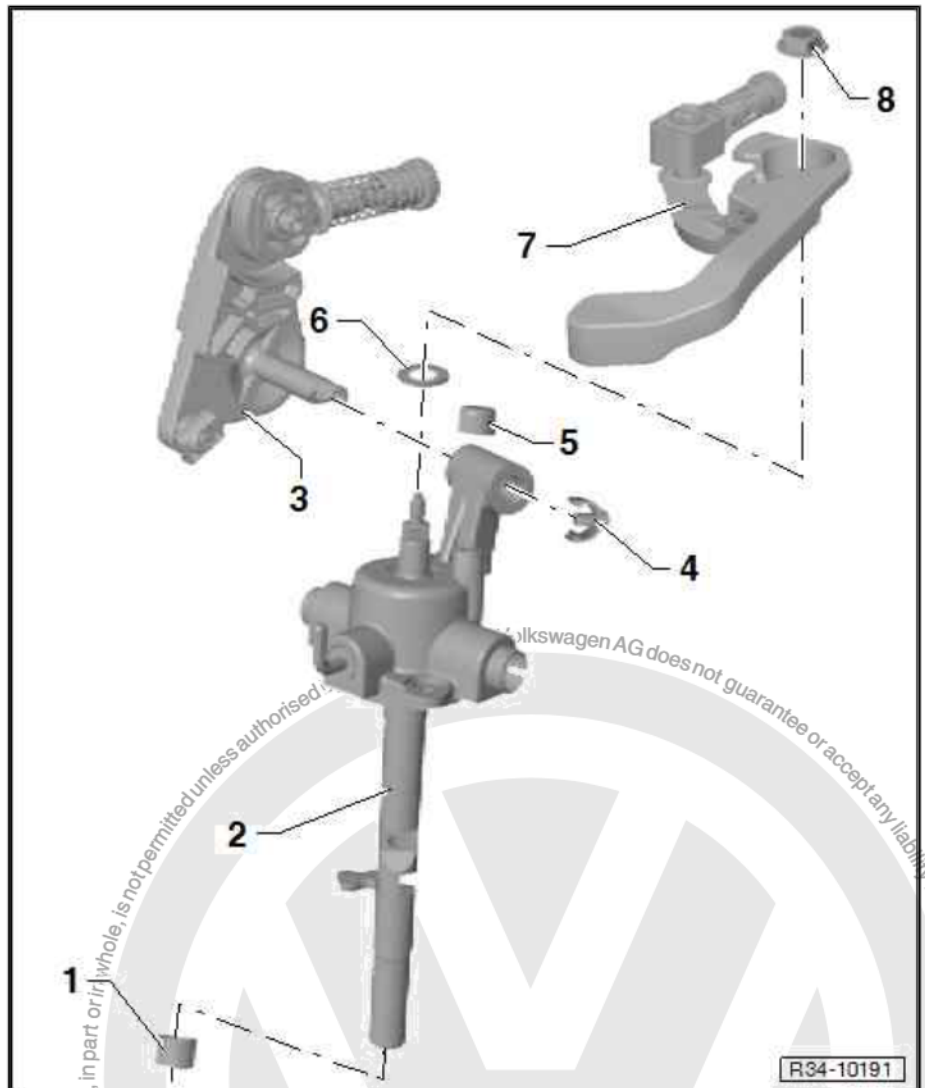
- ☐ Remove by using a screwdriver
- ☐ Install ⇒ [page 130](#)

## 7 - Gearbox selector lever

- ☐ Install in order that the grooves are aligned with those on the selector lever shaft
- ☐ It can be replaced with the selection mechanism installed
- ☐ Assignment ⇒ Electronic Parts Catalogue "ETKA"
- ☐ Installation position ⇒ [page 47](#)

## 8 - Hexagonal nut

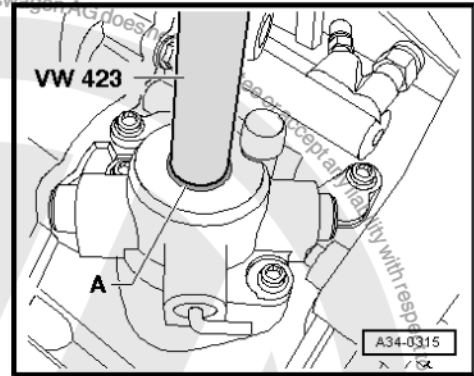
- ☐ Self-locking
- ☐  $20 \pm 2$  Nm
- ☐ Replace after every removal





#### Installing sealing ring

- Install sealing ring -A- to the stop, using the Pressure pipe - VW 423- .





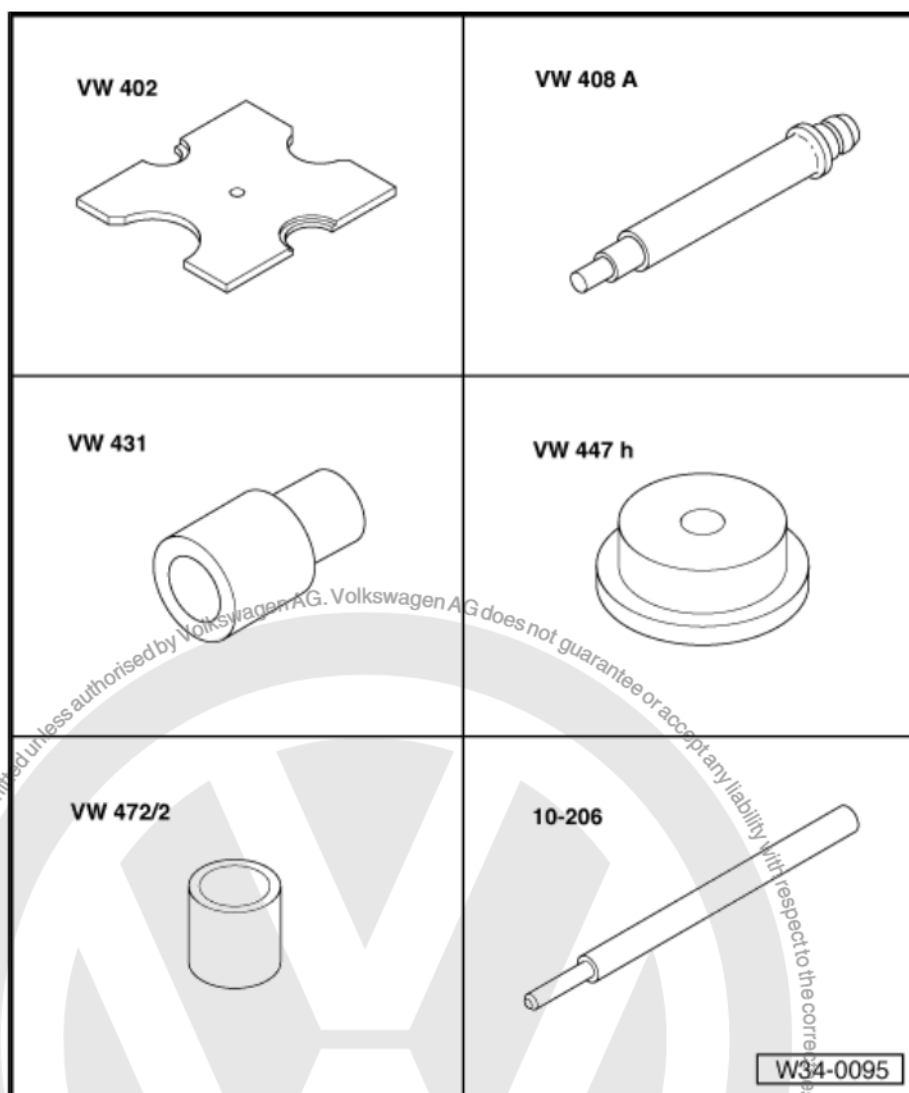


## 7 Selector forks

⇒ "7.1 Selector forks - disassemble and assemble", page 131

### 7.1 Selector forks - disassemble and assemble

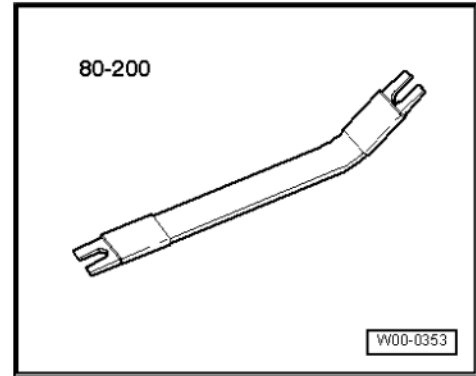
Special tools and workshop  
equipment required



- ◆ Plate - VW 402-
- ◆ Pressure pin - VW 408A-
- ◆ Pressure base - VW 431-
- ◆ Pressure base - VW 447H-
- ◆ Sleeve - VW 472/2-
- ◆ Pin or VW 010-206 - 10-206-



◆ Removal lever - 80-200-



Note

*To remove or install the selector segments (skids), circlips and ball bearings, you are not required to remove the change rail set.*

1 - Change rail set with selector forks

2 - Selector segment of 3rd / 4th gears

- ☐ Identification ⇒ [page 133](#)
- ☐ After assembling, it should move freely
- ☐ Individual selector segments are mounted in some gearboxes ⇒ [page 133](#)
- ☐ Identification of individual segments ⇒ [page 133](#)

3 - Ball bearing

- ☐ 4 units
- ☐ Removal ⇒ [page 134](#)
- ☐ Installation ⇒ [page 135](#)

4 - Circlip

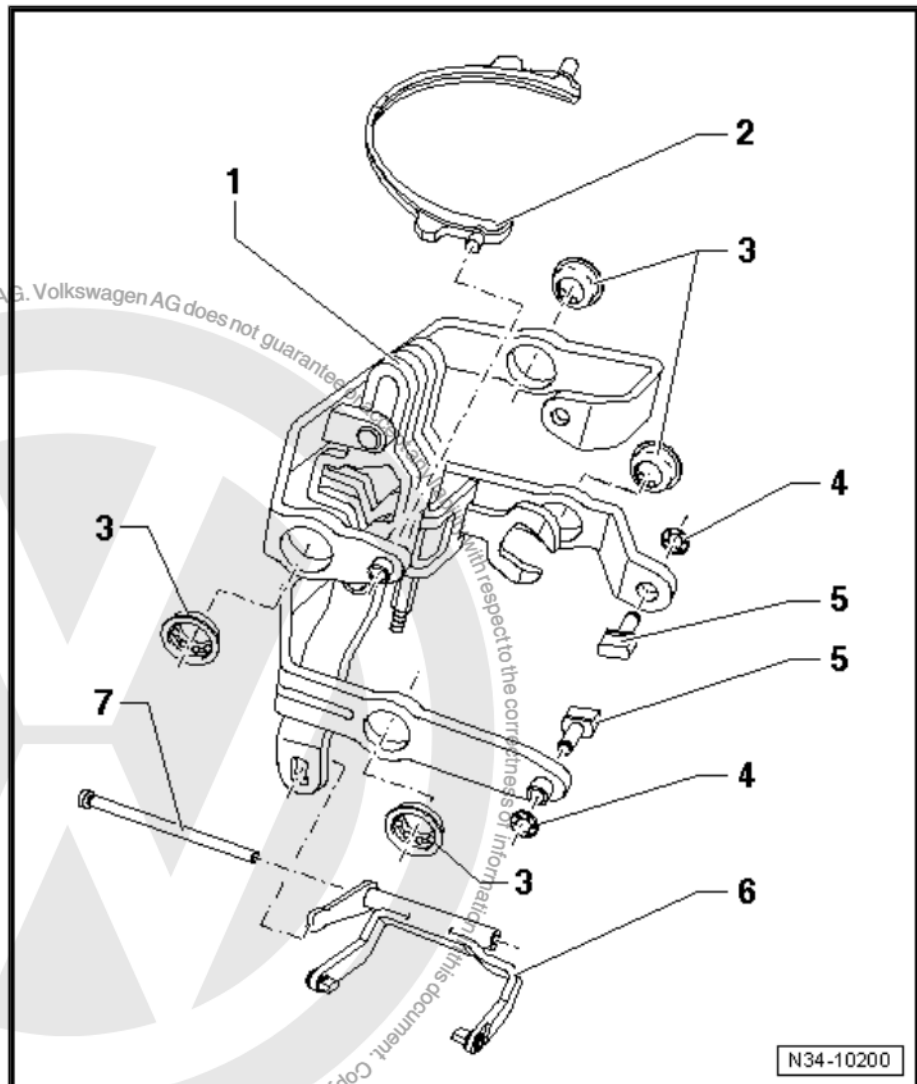
- ☐ Replace after each removal.
- ☐ Removal ⇒ [page 134](#)
- ☐ Installation ⇒ [page 134](#)

5 - Selector segment of 1st / 2nd gears

- ☐ Identification ⇒ [page 133](#)
- ☐ After assembling, it should move freely

6 - 5th gear selector fork with selector segment

- ☐ The selector segments should not be removed from the selector fork
- ☐ Identification ⇒ [page 133](#)





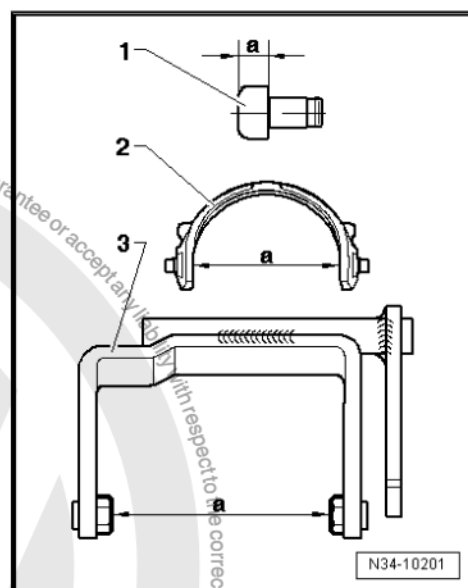
## 7 - Bearing pin

- For the selector fork for 5th gear

Identification of the selector segments of the 4th gear selector fork, including the selector segments of the 1st / 2nd gears and 3rd / 4th gears

Dimension -a- = 75 mm

- 1 - Selector segment of 1st / 2nd gears = 10.2 mm
- 2 - Selector segment of 3rd / 4th gears = 78.6 mm
- 3 - Selector fork for 5th gear, including the selector segments = 79.5 mm



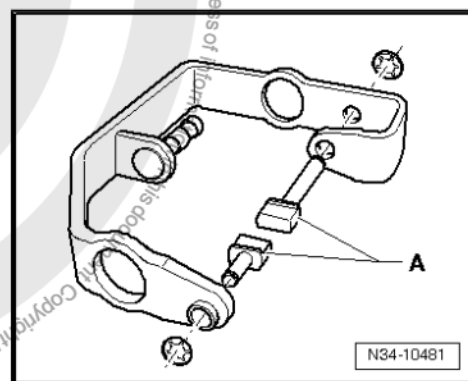
Individual selector segments of 3rd / 4th gear -A-

After assembling the gear selector segments, they should move freely.



Note

Only some transmissions have these individual segments.



Identification of the individual selector segments of the 3rd / 4th gears

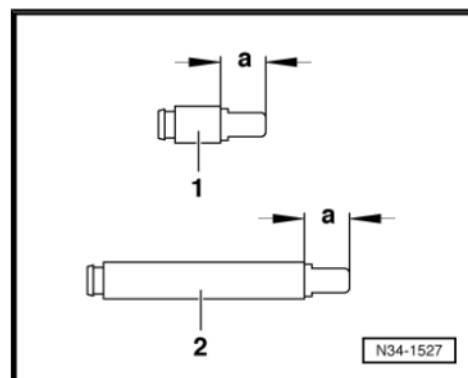
Dimension -a-:

- 1 - Short selector segment of 3rd / 4th gears = 10.2 mm
- 2 - Long selector segment of 3rd / 4th gears = 10.2 mm



Note

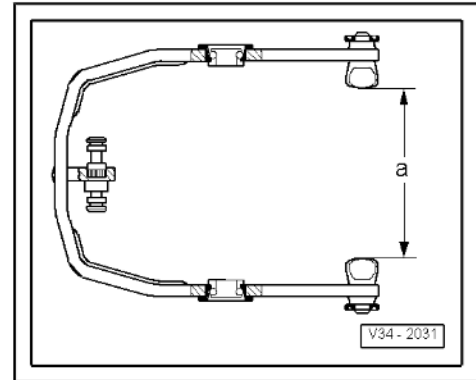
When removing or installing internal tracks, do not twist the selector forks.





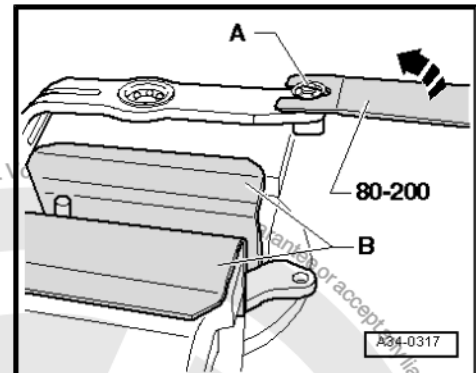
Selector fork for 1st/2nd gears, including the selector segments

Dimension -a- = 75 mm



Removing circlip

- Fasten the selector forks to the vice with jaw -B-.
- Remove circlip -A- by leveraging towards -arrow-.



Installing circlip

A - Barrel wrench 10

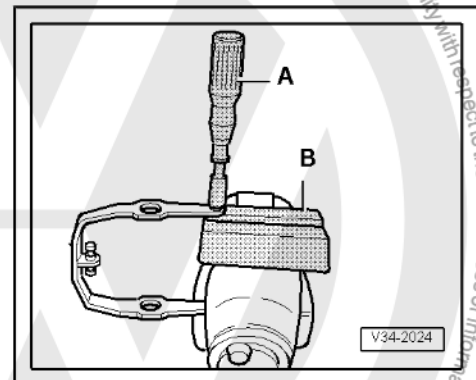
B - Jaw

- Press the circlip on the fork segment groove by using a barrel wrench.



Note

*After installing the circlip, the fork segment should move freely.*

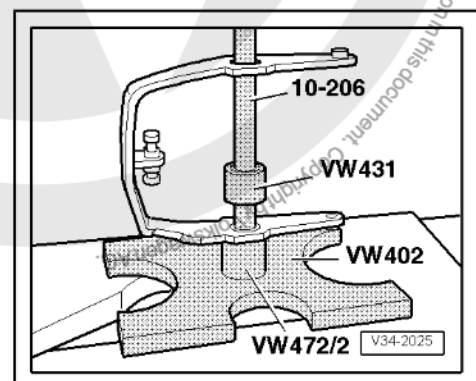


Removing ball bearing



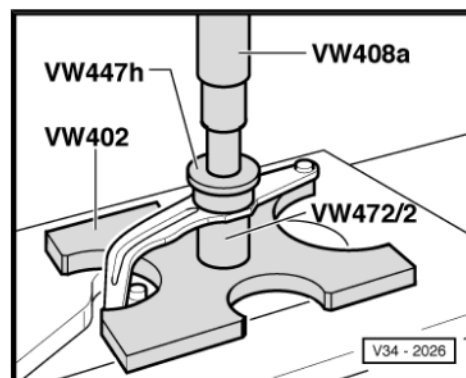
Note

*When removing or installing internal tracks, do not twist the selector forks.*





## Installation ball bearing





## 35 – Gears, shafts

### 1 Input shaft

⇒ [“1.1 Primary shaft - general overview of assembly”, page 136](#)

⇒ [“1.2 Input shaft - disassemble and assemble”, page 139](#)

#### 1.1 Primary shaft - general overview of assembly



##### WARNING

- ◆ *When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00*
- ◆ *Assignment of Chemical Materials ⇒ Electronic Parts Catalogue “ETKA”*



##### Note

- ◆ *Install all the roller bearings, gears and synchronizer rings on the input shaft, lubricated with gear oil.*
- ◆ *Do not invert the synchronizer rings. When reusing synchronizer rings, always install them on the same gear pair.*





1 - Circlip

- ☐ Replace after each re-  
moval.
- ☐ Determine thickness  
⇒ [page 120](#)

2 - Engaging sleeve with 5th  
gear synchronizer

- ☐ Disassemble and as-  
semble ⇒ [page 146](#)

3 - Synchronizer ring for 5th  
gear

- ☐ Wear check  
⇒ [page 144](#)

4 - 5th gear wheel

5 - Needle bearing

- ☐ For 5th gear
- ☐ Change with bushing  
⇒ [Item 6 \(page 137\)](#)

6 - Bushing

- ☐ For 5th gear needle  
bearing
- ☐ Change with roller bear-  
ing ⇒ [Item 5 \(page 137\)](#)
- ☐ Remove with ball bear-  
ing support  
⇒ [page 142](#)
- ☐ Installation ⇒ [page 145](#)

7 - Gearbox housing

- ☐ Assignment ⇒ Electron-  
ic Parts Catalogue "ET-  
KA"
- ☐ Repair ⇒ [page 121](#)
- ☐ In case of replacement, always adjust differential ⇒ [page 173](#)
- ☐ Apply Sealing compound - AMV 188 200 03- evenly over the sealing surface of the gearbox housing.

8 - Roller bearing support with ball bearing

- ☐ Check and replace whenever damaged
- ☐ Clean the threaded holes of the roller bearing support (e.g. Tap M6)
- ☐ Removal ⇒ [page 142](#)
- ☐ Installation ⇒ [page 145](#)

9 - Input shaft

10 - Needle bearing

- ☐ For 3rd gear

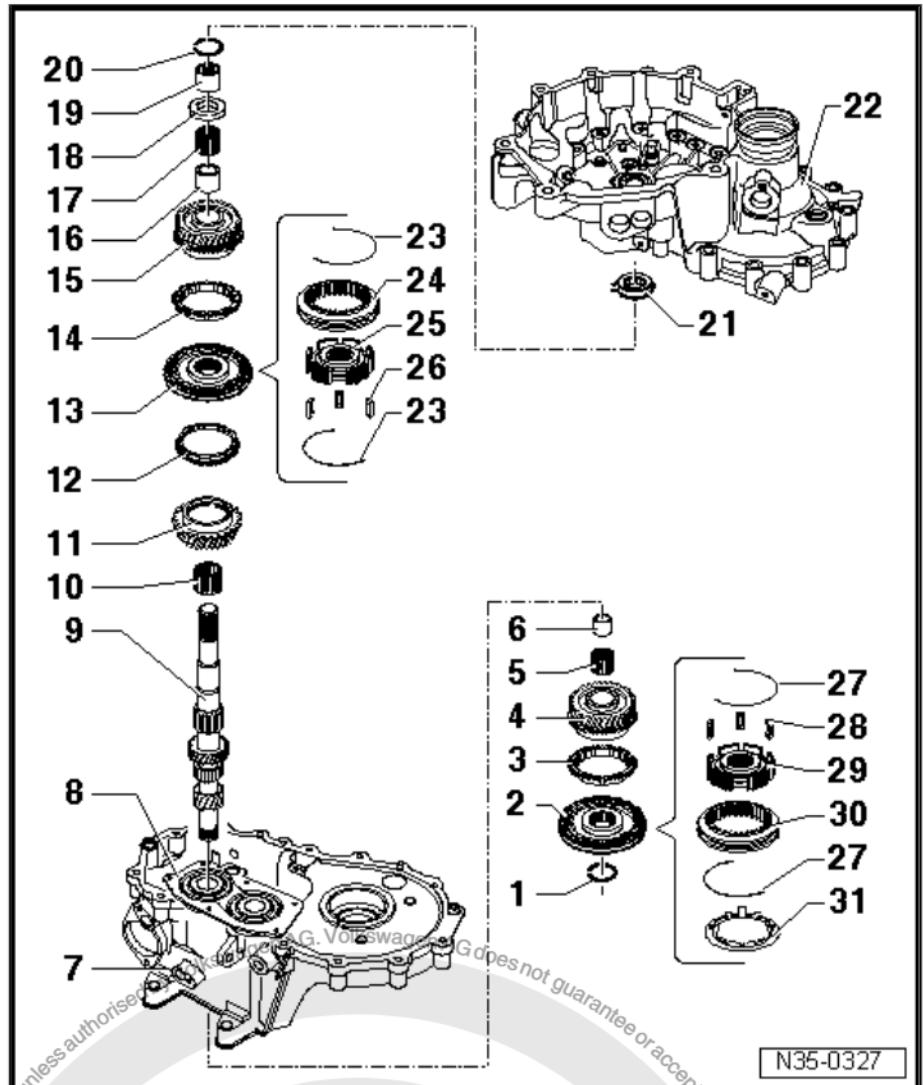
11 - 3rd gear wheel

12 - Synchronizer ring for 3rd gear

- ☐ Wear check ⇒ [page 144](#)

13 - Engaging sleeve with 3rd and 4th gear synchronizer

- ☐ Remove with 3rd gear wheel ⇒ [page 143](#)
- ☐ Disassemble and assemble ⇒ [page 143](#)
- ☐ Installation position of the engaging sleeve/synchronizer ring ⇒ [page 143](#)
- ☐ Installation ⇒ [page 144](#)



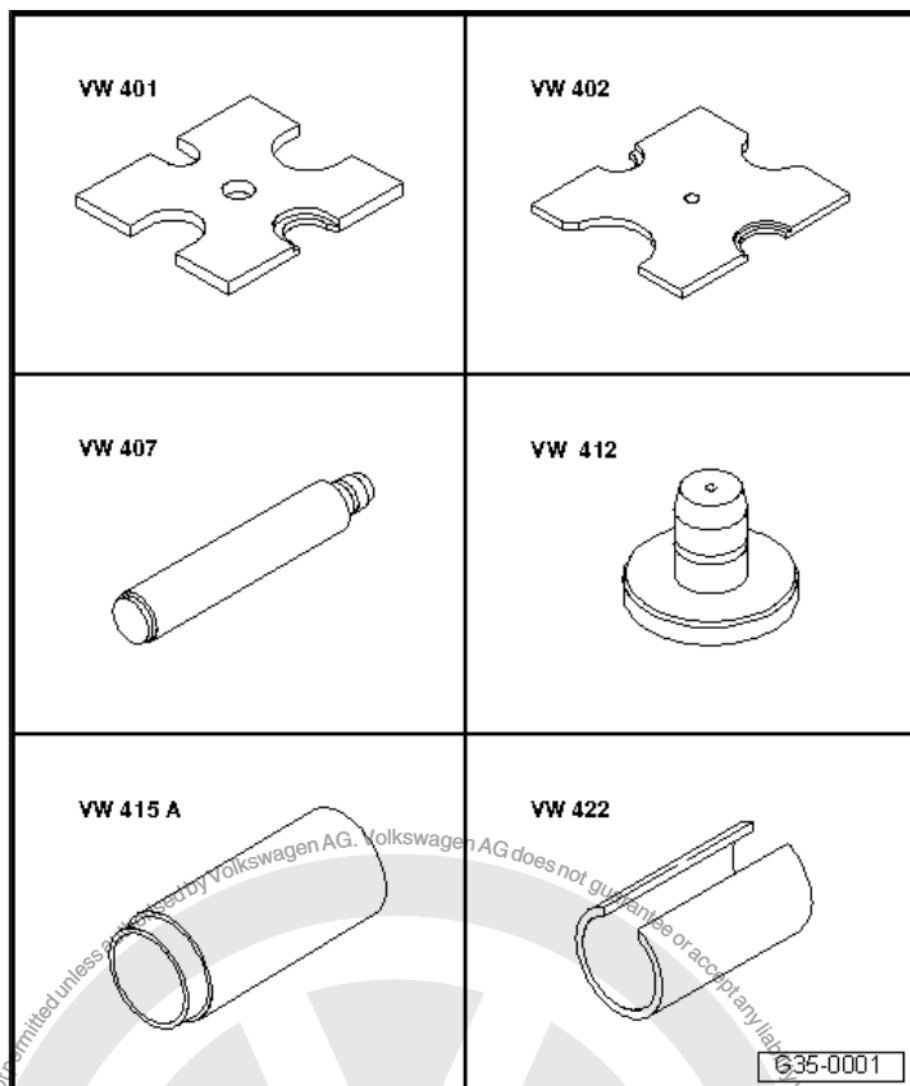


- 14 - Synchronizer ring for 4th gear
  - ☐ Wear check ⇒ [page 144](#)
- 15 - 4th gear wheel
- 16 - Bushing
  - ☐ For 4th gear needle bearing
  - ☐ Change with needle bearing ⇒ [Item 17 \(page 138\)](#)
  - ☐ Remove with 3rd gear wheel ⇒ [page 142](#)
  - ☐ Installation ⇒ [page 144](#)
- 17 - Needle bearing
  - ☐ For 4th gear
  - ☐ Change with bushing ⇒ [Item 16 \(page 138\)](#)
- 18 - Sealing washer
- 19 - Inner ring on the tapered roller bearing
  - ☐ Removal ⇒ [page 142](#)
  - ☐ Installation ⇒ [page 144](#)
- 20 - Circlip
  - ☐ Replace
  - ☐ Thickness determination ⇒ [page 145](#)
- 21 - Tapered roller bearing
  - ☐ With circlip
  - ☐ Removal ⇒ [page 142](#)
  - ☐ Installation ⇒ [page 142](#)
  - ☐ Installation position: the roller bearing circlip should face the input shaft
- 22 - Clutch housing
  - ☐ Assignment ⇒ Electronic Parts Catalogue "ETKA"
  - ☐ Repair ⇒ [page 121](#)
  - ☐ In case of replacement, always adjust differential ⇒ [page 173](#)
  - ☐ Apply Sealing compound - AMV 188 200 03- evenly over the sealing surface of the gearbox housing.
- 23 - Spring
  - ☐ Installation position ⇒ [page 143](#)
- 24 - Engaging sleeve for 3rd and 4th gears
- 25 - Synchronizer for 3rd and 4th gears
- 26 - Retainers
  - ☐ 3 units
- 27 - Spring
  - ☐ Installation position ⇒ [page 146](#)
- 28 - Retainers
  - ☐ 3 units
- 29 - Synchronizer for 5th gear
- 30 - Engaging sleeve for 5th gear
- 31 - Stop ring
  - ☐ Prevents retainer "escape"
  - ☐ Removal ⇒ [page 146](#)
  - ☐ Installation ⇒ [page 147](#)

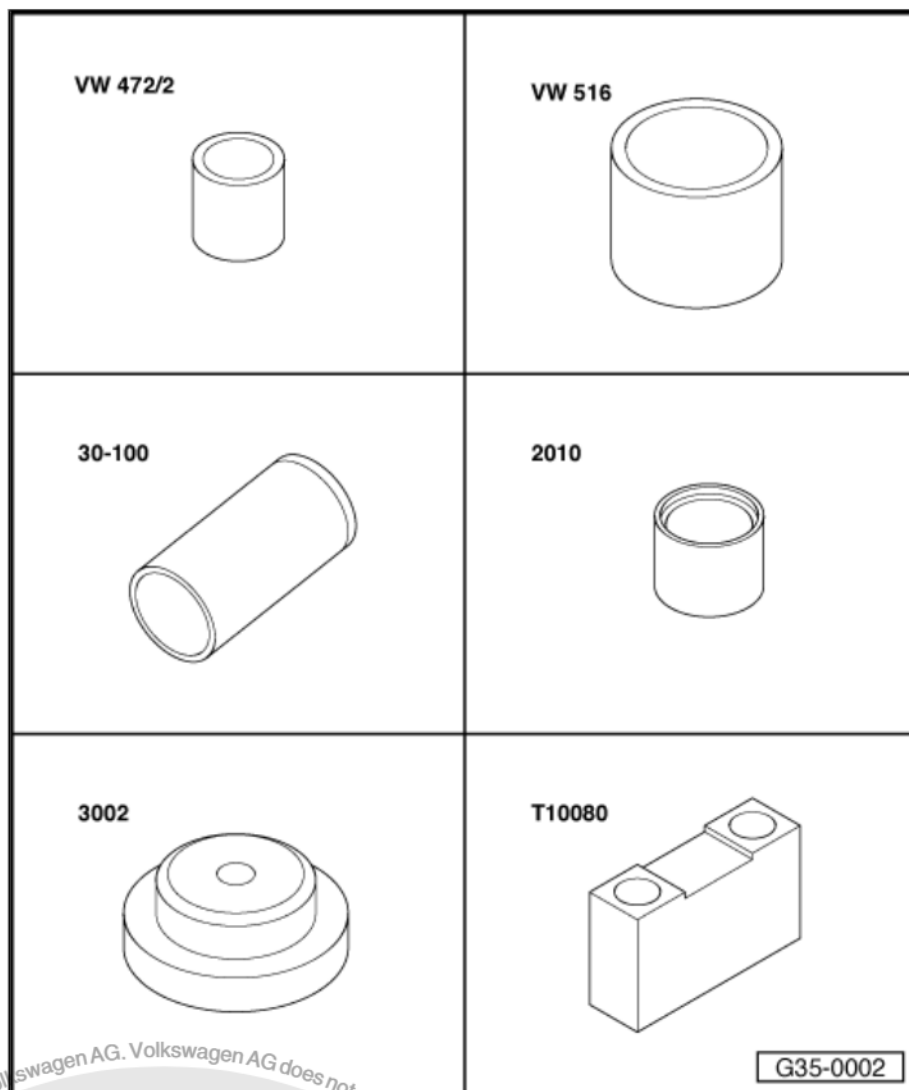


## 1.2 Input shaft - disassemble and assemble

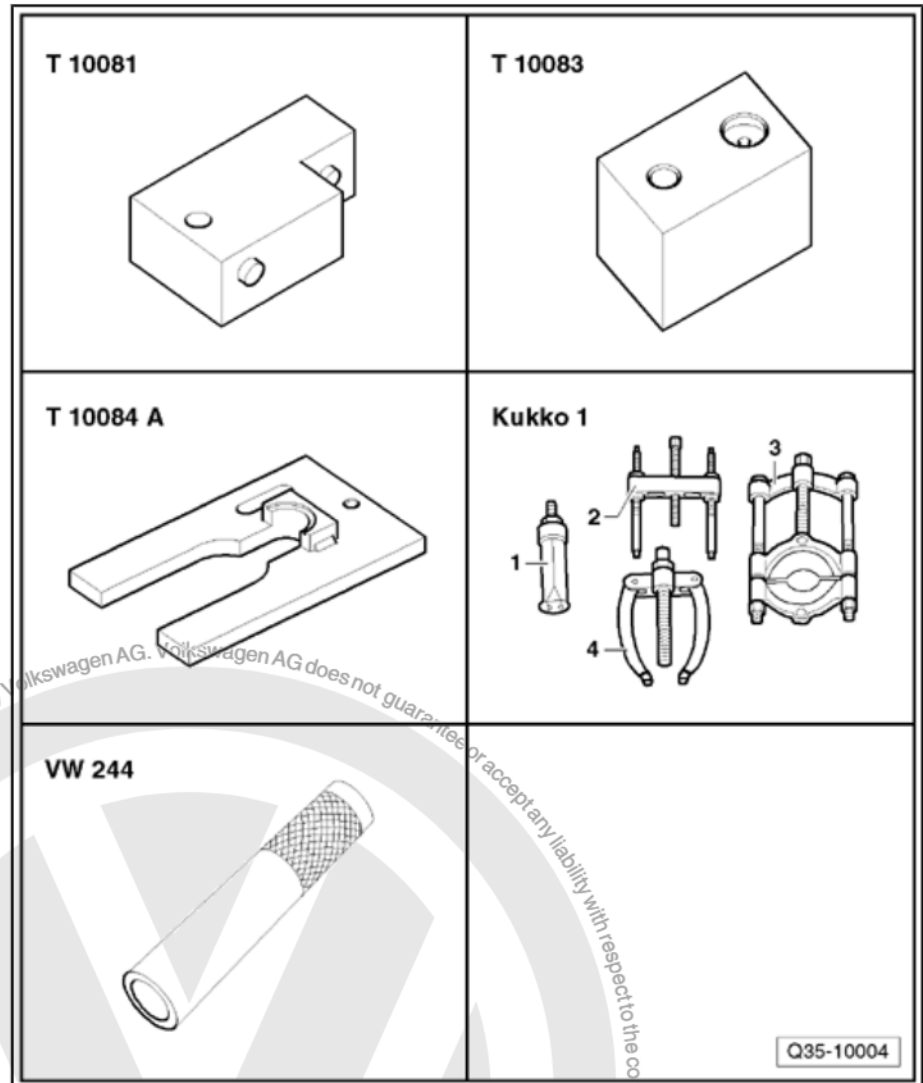
Special tools and workshop  
equipment required



- ◆ Plate - VW 401-
- ◆ Plate - VW 402-
- ◆ Pressure pin - VW 407-
- ◆ Pressure disc - VW 412-
- ◆ Pressure tube - VW 415A-
- ◆ Pressure tube - VW 422-



- ◆ Sleeve - VW 472/2-
- ◆ Tube - VW 516-
- ◆ Tube - 30-100-
- ◆ Tube - 2010-
- ◆ Pressure base or VW 3002 - 3002-
- ◆ Pressure shim - T 10080-



- ◆ Pressure shim - T 10081-
- ◆ Pressure shim - T 10083-
- ◆ Pressure plate - T 10084A-
- ◆ -1- Puller 30 - 37 mm or VW 020P - Kukko 21/5-
- ◆ -2- Puller 65 - 160 mm - KUKKO 18/1-
- ◆ -3- Spacer 12 - 75 mm - KUKKO 17/1-
- ◆ -4- Auxiliary support - KUKKO 22/1-
- ◆ Fitting tool - VW 244-

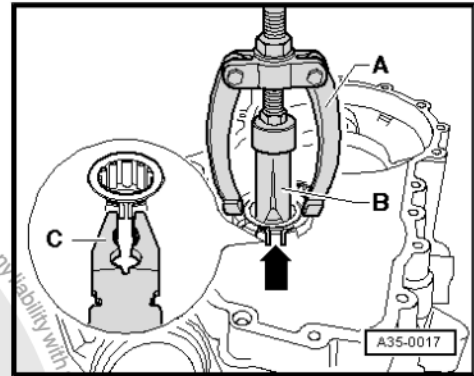


### Removing tapered roller bearing on clutch housing

A - Auxiliary support - KUKKO 22/1-

B - 30 - 37 mm Puller or VW 020P - Kukko 21/5-

- When removing it, compress the bearing circlip -arrow- with pliers -C-.

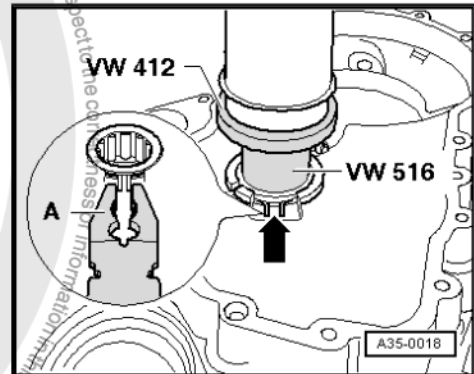


### Installing tapered roller bearing on clutch housing

- Support the clutch housing by placing the Pressure pipe - VW 415A- (not shown in fig.) directly under the bearing support.

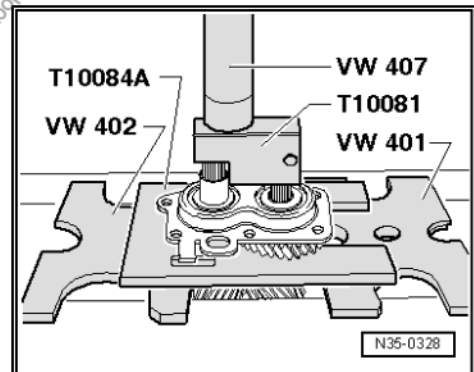
- When installing, compress the bearing circlip -arrow- with pliers -A-.

- Remove the pliers just before the bearing is in the correct installation position. The circlip shall be locked in the clutch housing hole.



### Removing the bearing support with ball bearings

- Place the car in 2nd gear.
- Push Thrust plate - T 10084A- laterally to the input shaft stop.
- Install the centralizing pins of the Pressure shim - T 10081- in the orifices of the input and output shafts.



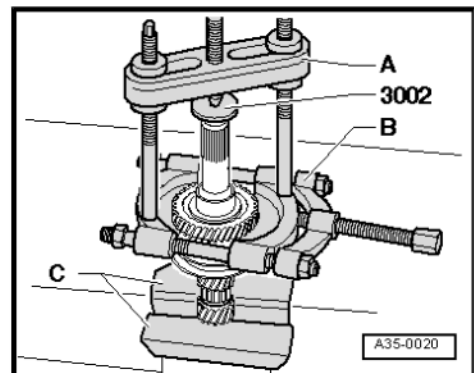
### Removing the inner ring of the tapered roller bearing with the 4th gear wheel

A - 65 - 160 mm puller - KUKKO 18/1-

B - 12 - 75 mm separator - KUKKO 17/1-

C - Protection shims

- Remove circlip first.
- Fasten the Spacer 12 - 75 mm - KUKKO 17/1- -B- behind the helical teeth (not in the gear teeth) of 4th gear.

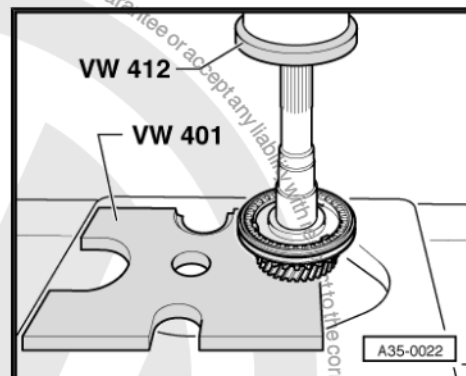






### Removal of engaging sleeve with 3rd and 4th gear synchronizer

- After removing the circlip, disengage together the moving gear of the 3rd gear and the engaging sleeve with the synchronizer.

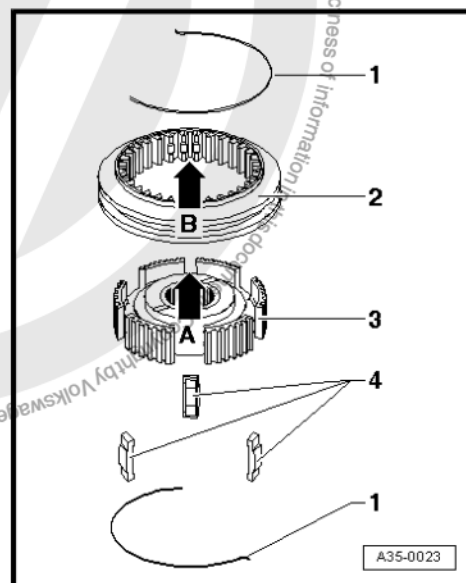


### Disassembling and assembling the engaging sleeve and the 3rd and 4th gear synchronizer

- 1 - Spring
- 2 - Engaging sleeve
- 3 - Synchronizer
- 4 - Retainers

- Press the engaging sleeve on the synchronizer.

The deeper grooves -arrow A- for the limiters located on the synchronizer should match the grooves -arrow B- on the engaging sleeve.



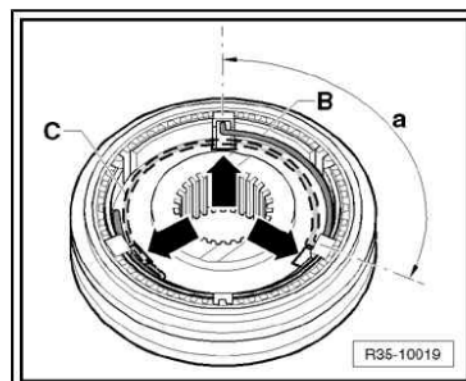
- Install the retainers in the deeper grooves -arrows-.
- Press the engaging sleeve on the synchronizer
- Install springs -B- and -C- displaced by -a-



Note

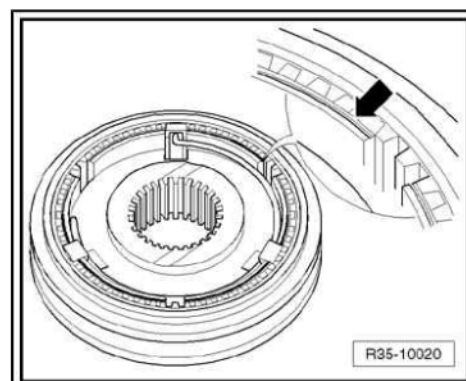
-a- = 120°

- The folded end of the spring should fit into the limiter's hole.



### Installation position of the 3rd and 4th gear engaging sleeve/synchronizer

The front face notch -arrow- should face the 4th gear side.

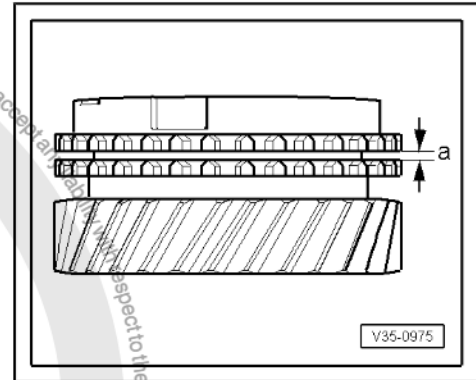




#### Checking the wear on the synchronizer ring

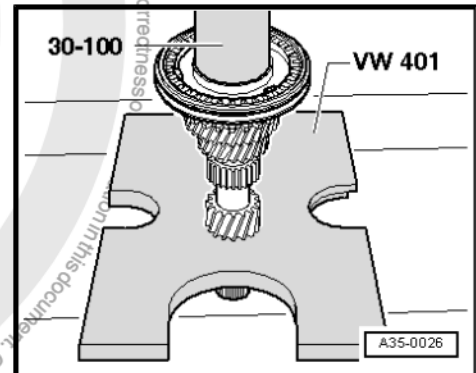
- Press the synchronizer ring against the gear cone and measure the distance -a- with feeler gauge.

Distance -a-	New part	Wear limit
3rd, 4th and 5th gears	1.1..1.7 mm	0.5 mm



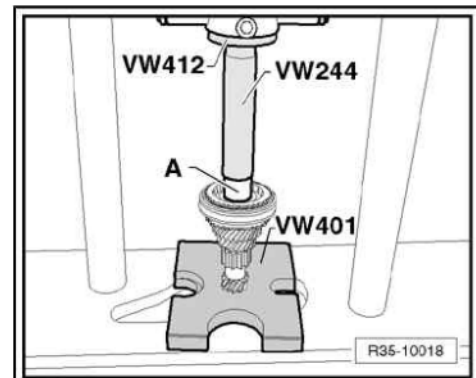
#### Installation of the synchronizer with the 3rd and 4th gear engaging sleeve

- When pressing, secure the 3rd gear wheel with the synchronizer ring fitted in the 3rd and 4th engaging sleeve/synchronizer.

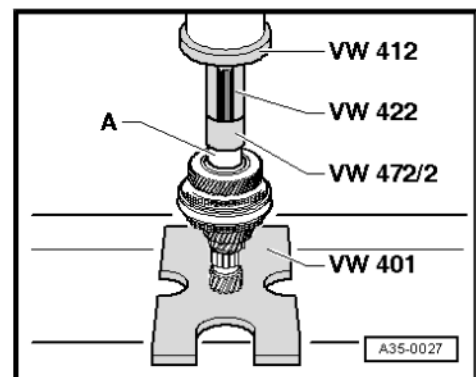


#### Installing the bushing on the needle bearing of 4th gear -A-

- Install 4th gear wheel.



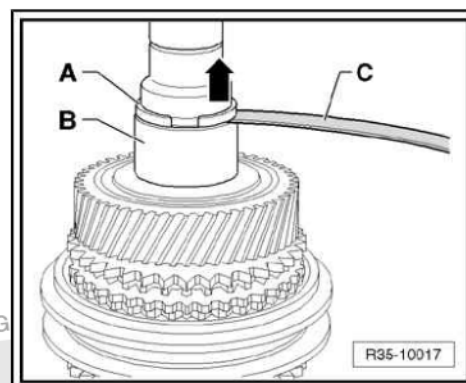
#### Installation of the inner ring on the tapered roller bearing -A-





### Determination of the circlip thickness

- Install a circlip with 2.0 mm thickness -A- in the input shaft groove and press upwards -arrow-.
- Determine the distance between the inner ring -B- and the circlip installed -A- by using a feeler gauge -C-.
- Remove the circlip used for measurement.
- Use the table to determine the circlip to be installed.



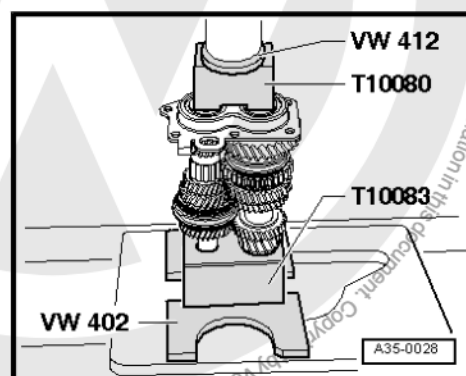
Note

Assignment: ➤ Electronic Parts Catalogue "ETKA"

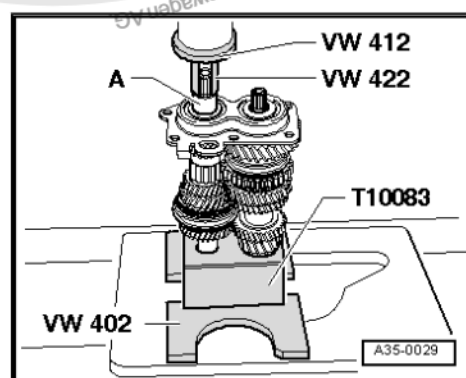
### Available circlips

Value measured (mm)	Circlip thickness (mm)	Axial clearance (mm)
0,05 ... 0.10	2.0	0,05 ... 0.15
0,15 ... 0.20	2.1	0,05 ... 0.15
0,25 ... 0.30	2.2	0,05 ... 0.15
0,35 ... 0.40	2.3	0,05 ... 0.15
0,45 ... 0.50	2.4	0,05 ... 0.10

### Installing the bearing support with ball bearings



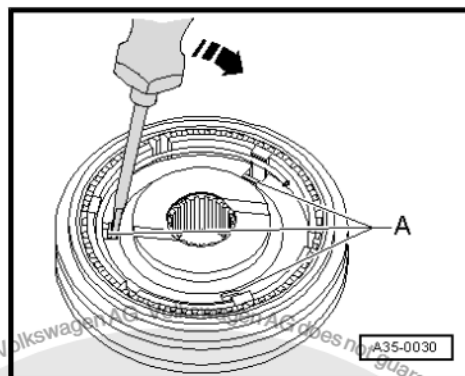
### Installing the bushing -A- for the needle bearing of 5th gear





### Removing the stop ring

- Disengage hooks -A- from the stop ring with a screwdriver.



### Disassembling and assembling the 5th gear engaging sleeve and synchronizer

1 - Spring

2 - Retainers

3 - Synchronizer

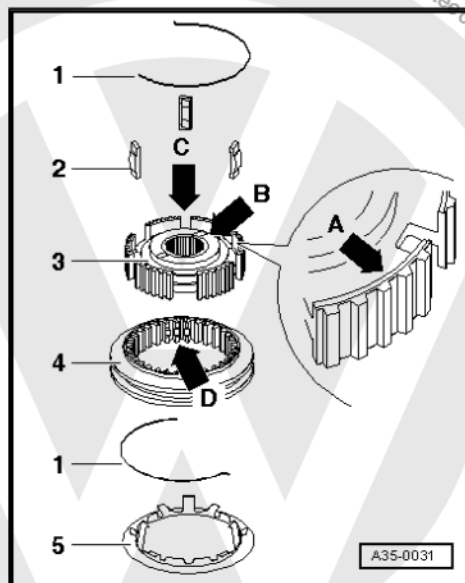
- Installation position: the front face notch -arrow A- and the wide collar -arrow B- should face the 5th gear.

4 - Engaging sleeve

5 - Stop ring

- Press the engaging sleeve on the synchronizer.

The deeper grooves -arrow C- for the limiters located on the synchronizer should match the grooves -arrow D- on the engaging sleeve.



- Install the retainers in the deeper grooves -arrows-

- Press the engaging sleeve on the synchronizer

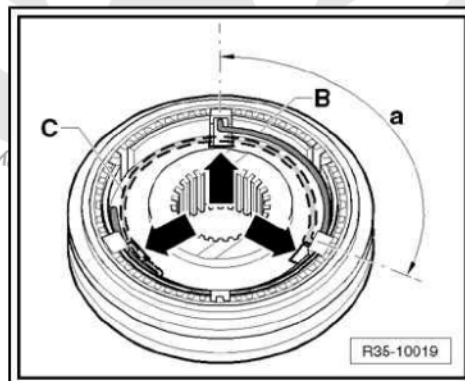
- Install springs -B- and -C- displaced by -a-.



Note

-a- = 120°

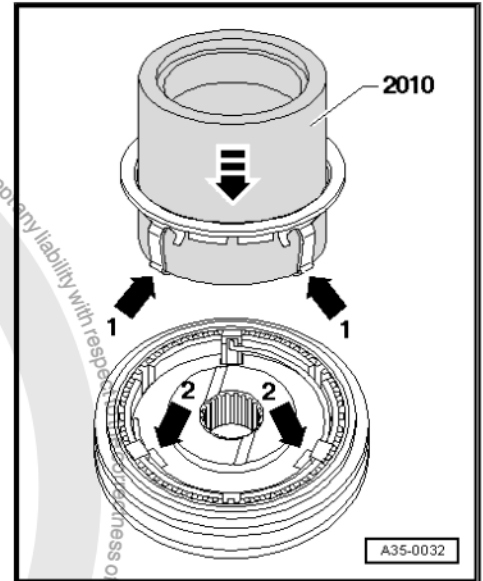
- The folded end of the spring should fit into the limiter's hole.





#### Installing stop ring

- Fit the ring in Tube - 2010-
- Introduce the Tube - 2010- with the 5th gear synchroniser ring, observing the correct installation position. The hooks -arrow 1- should fit in the notches -arrow 2- of the synchronizer limiters.
- Press the stop ring downwards until locking the hooks.





## 2 Planet pinion

⇒ "2.1 Pinion shaft - general overview of assembly", page 148

⇒ "2.2 Planet pinion - disassemble and assemble", page 151

### 2.1 Pinion shaft - general overview of assembly



#### WARNING

- ◆ *When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00*
- ◆ *Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"*



#### Note

- ◆ *Install all the roller bearings, gears and synchronizer rings on the input shaft, lubricated with gear oil.*
- ◆ *Do not invert the synchronizer rings. When reusing synchronizer rings, always install them on the same gear pair.*





### 1 - Clutch housing

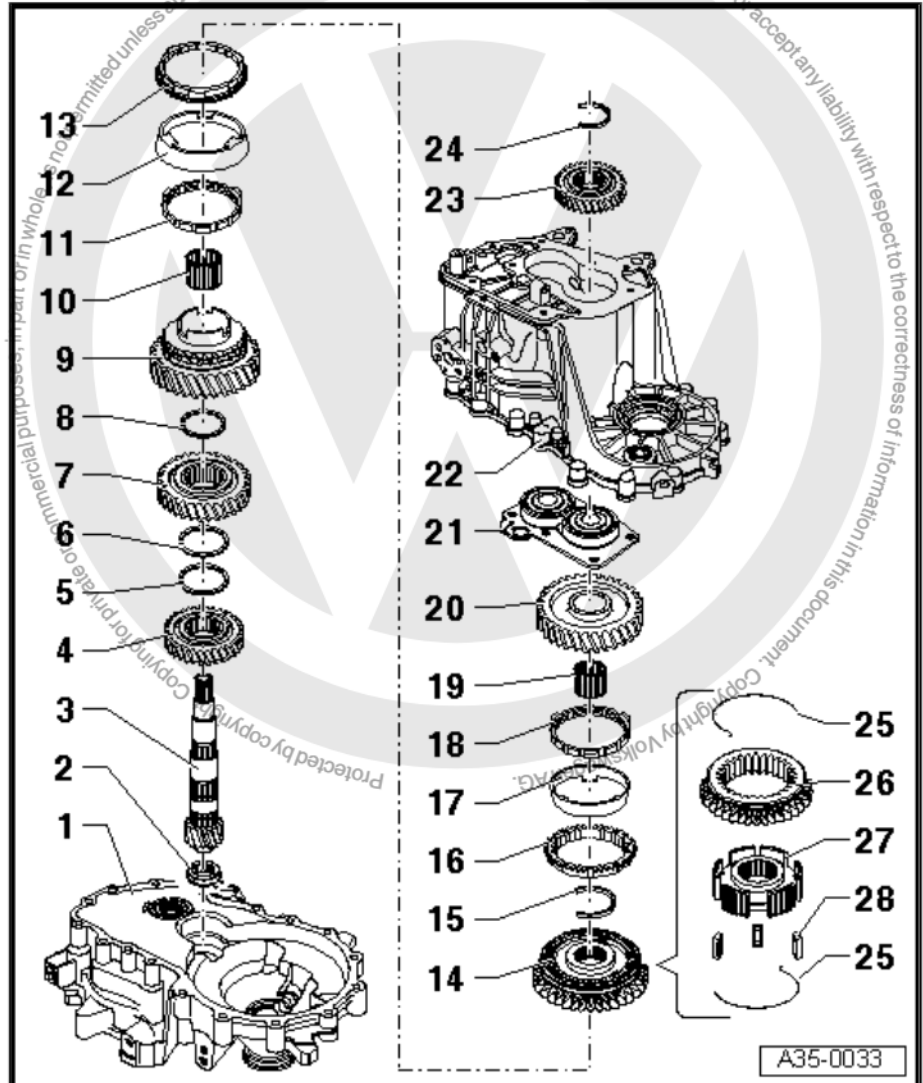
- ☐ Assignment ⇒ Electronic Parts Catalogue "ET-KA"
- ☐ Repair ⇒ [page 121](#)
- ☐ In case of replacement, always adjust differential ⇒ [page 173](#)
- ☐ Apply Sealing compound - AMV 188 200 03- evenly over the sealing surface of the gearbox housing.

### 2 - Tapered roller bearing

- ☐ With circlip
- ☐ Removal ⇒ [page 152](#)
- ☐ Installation ⇒ [page 152](#)
- ☐ Installation position: the circlip should face the planet pinion

### 3 - Planet pinion

- ☐ If it is necessary to replace the planet pinion, the crown wheel should also be replaced ⇒ [Item 17 \(page 166\)](#) .
- ☐ If there is an inner ring as tapered roller bearing mounting, this should not be removed from the planet pinion.
- ☐ If scratches or damages are detected on the roller bearing mounting or inner ring, replace the planet pinion and the tapered roller bearing as a set.



### 4 - 4th gear wheel

- ☐ Installation position: the hub should face the 3rd gear ⇒ [page 153](#)

### 5 - Circlip

### 6 - Circlip

### 7 - 3rd gear wheel

- ☐ Installation position: the hub should face the 4th gear ⇒ [page 153](#)

### 8 - Circlip

### 9 - 2nd gear wheel

### 10 - Needle bearing

- ☐ For 2nd gear

### 11 - Inner ring for 2nd gear

- ☐ Wear check ⇒ [page 153](#)
- ☐ Installation position ⇒ [page 154](#)

### 12 - Outer ring for 2nd gear

- ☐ Install on inner ring ⇒ [Item 11 \(page 149\)](#)
- ☐ Change in case of scratches or wear signs
- ☐ Installation position ⇒ [page 154](#)



13 - Synchronizer ring for 2nd gear

- ☐ Wear check ⇒ [page 154](#)
- ☐ Installation position ⇒ [page 154](#)

14 - Engaging sleeve with synchronizer for 1st and 2nd gears

- ☐ Remove with 2nd gear wheel after removing the circlip ⇒ [page 153](#)
- ☐ Disassemble and assemble the engaging sleeve/synchronizer ring ⇒ [page 154](#)
- ☐ Installation ⇒ [page 155](#)

15 - Circlip

- ☐ Removal ⇒ [page 153](#)
- ☐ Installation ⇒ [page 155](#)

16 - Synchronizer ring for 1st gear

- ☐ Wear check ⇒ [page 154](#)
- ☐ Install in order that the notches fit in the engaging sleeve limiters ⇒ [Item 14 \(page 150\)](#)

17 - Outer ring for 1st gear

- ☐ Install on synchroniser ring ⇒ [Item 16 \(page 150\)](#)
- ☐ Installation position ⇒ [page 155](#)
- ☐ Change in case of scratches or wear signs

18 - Inner ring for 1st gear

- ☐ Wear check ⇒ [page 153](#)
- ☐ Check the flanges for wear signs
- ☐ Installation position ⇒ [page 156](#)

19 - Needle bearing

- ☐ For 1st gear

20 - 1st gear wheel

- ☐ Installation position ⇒ [page 156](#)

21 - Roller bearing support with ball bearing

- ☐ Check and replace whenever damaged
- ☐ Clean the threaded holes of the roller bearing support (e.g. Tap M6)
- ☐ Removal ⇒ [page 142](#)
- ☐ Installation ⇒ [page 145](#)

22 - Gearbox housing

- ☐ Assignment ⇒ Electronic Parts Catalogue "ETKA"
- ☐ Repair ⇒ [page 121](#)
- ☐ In case of replacement, always adjust differential ⇒ [page 173](#)
- ☐ Apply Sealing compound - AMV 188 200 03- evenly over the sealing surface of the gearbox housing.

23 - 5th gear wheel

- ☐ Installation position: the hub shall face the gearbox housing side ⇒ [page 120](#)

24 - Circlip

- ☐ Replace after every removal
- ☐ Determine thickness ⇒ [page 120](#)

25 - Spring

- ☐ Installation position ⇒ [page 155](#)

26 - Engaging sleeve

27 - Synchronizer

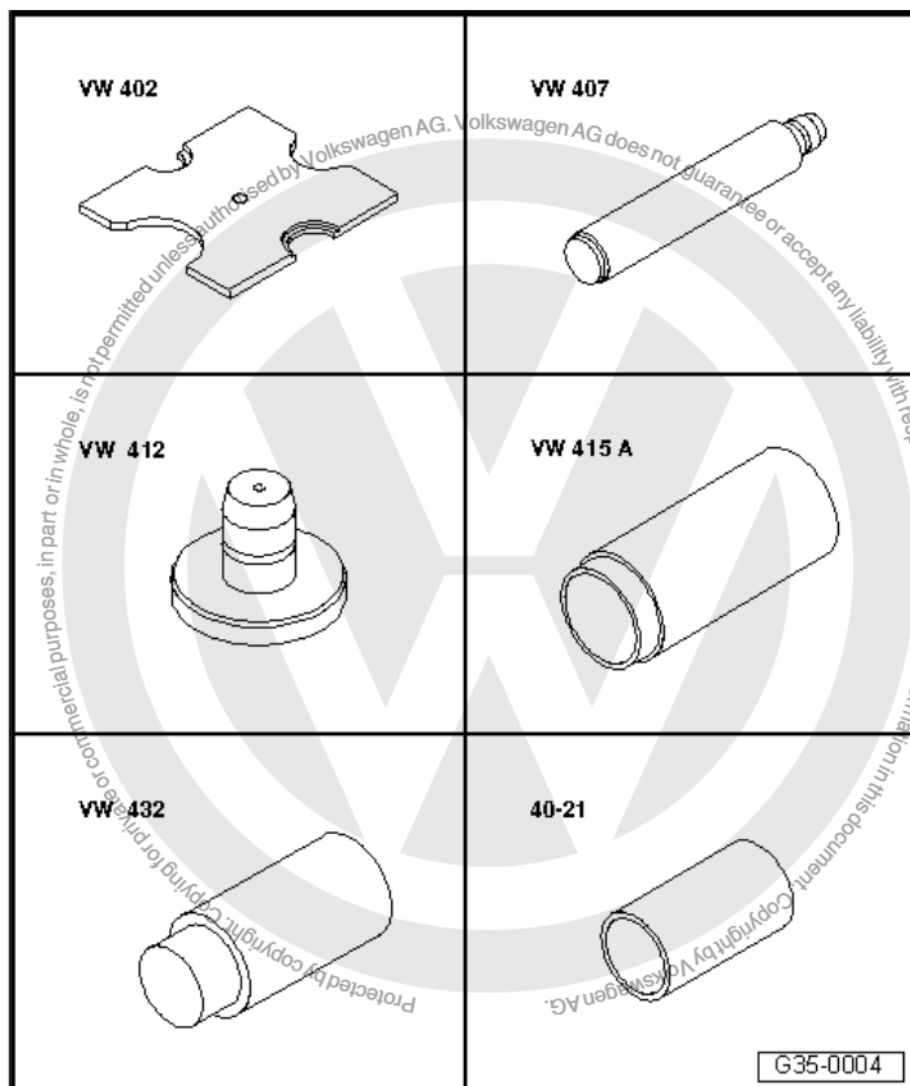
28 - Retainers

- ☐ 3 units

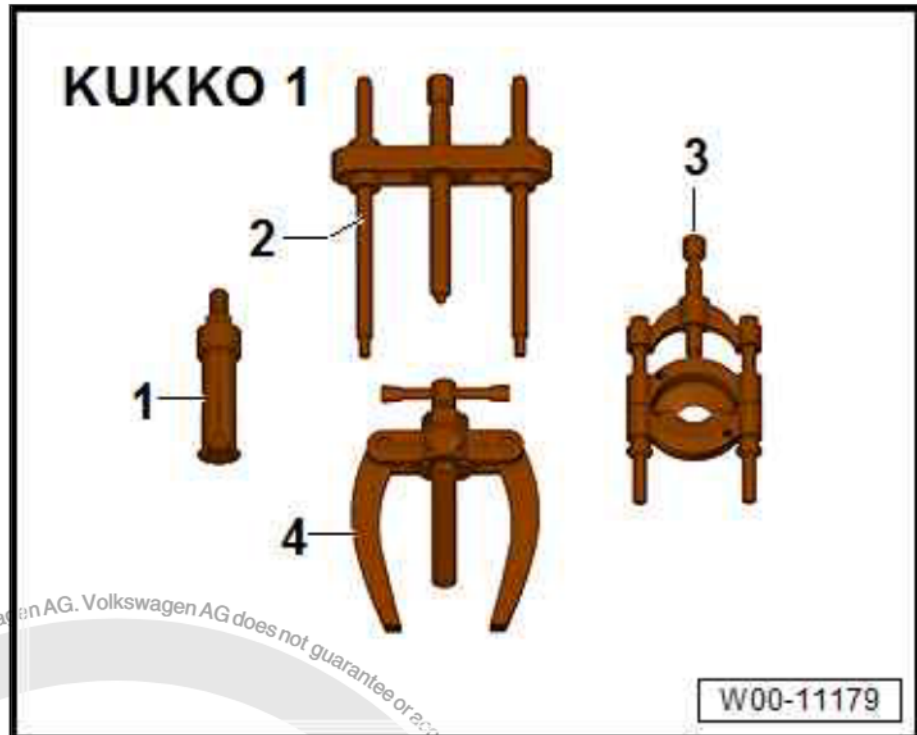


## 2.2 Planet pinion - disassemble and assemble

Special tools and workshop equipment required



- ◆ Plate - VW 402-
- ◆ Pressure pin - VW 407-
- ◆ Pressure disc - VW 412-
- ◆ Pressure tube - VW 415A-
- ◆ Pressure base - VW 432-
- ◆ Support tube - 40-21-



◆ -1- 30 - 37mm Puller or VW 020P - Kukko 21/5-

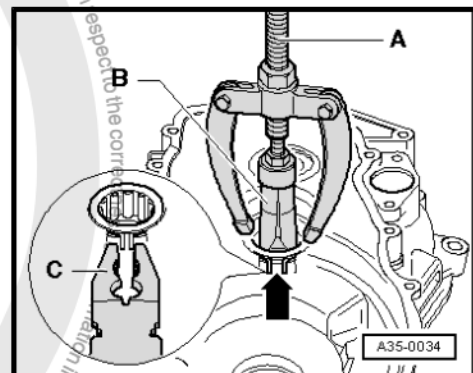
◆ -4- Auxiliary support - KUKKO 22/1-

Removing tapered roller bearing on clutch housing

A - Auxiliary support - KUKKO 22/1-

B - 30 - 37 mm Puller or VW 020P - Kukko 21/5-

- When removing it, compress the bearing circlip -arrow- with pliers -C-.

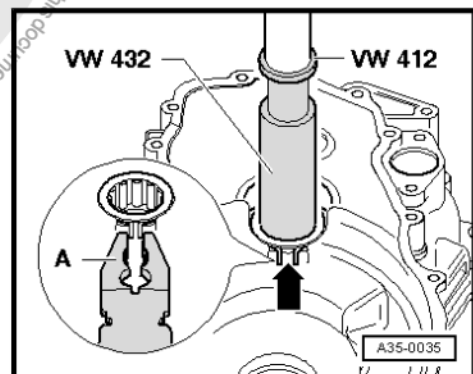


Installing the tapered roller bearing on clutch housing

- Support the clutch housing by placing the Pressure pipe - VW 415A- (not shown in fig.) directly under the bearing support.

- When installing, compress the bearing circlip -arrow- with pliers -A-.

- Remove the pliers just before the bearing is in the correct installation position. The circlip shall be locked in the clutch housing hole.





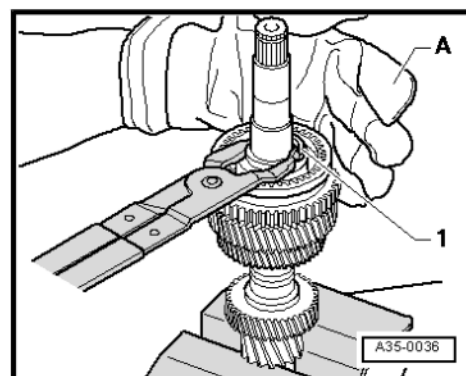
Removing circlip -1- from notch

A - Safety sleeve



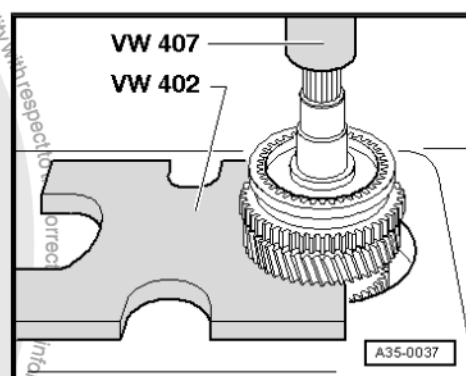
**WARNING**

*Carefully remove circlip.*



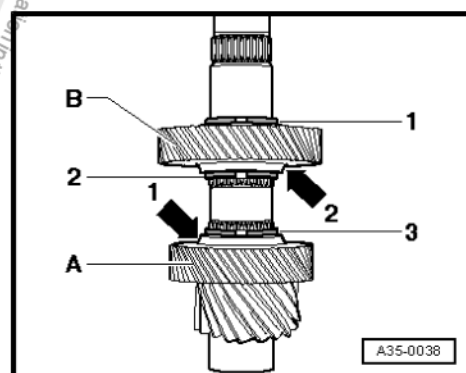
Removing 1st and 2nd engaging sleeve/synchronizer

After removing the circlip, disengage together the moving gear of the 2nd gear and the engaging sleeve with the synchronizer.



Installation position of 3rd and 4th gear wheels

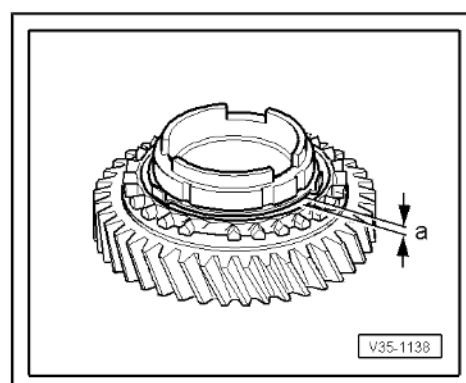
- Install 4th gear wheel -A- on planet pinion.
- The collar -arrow 1- shall face the 3rd gear wheel -B-.
- Install circlips -2- and -3-.
- Install 3rd gear wheel -B- on planet pinion.
- The hub -arrow 2- shall face the 4th gear wheel -A-.
- Install circlip -1-.



Wear check of the inner ring of 1st and 2nd gears

- Press the inner ring against the gear cone and measure the distance -a- with a feeler gauge.

Distance -a-	New part	Wear limit
1st and 2nd gears	0,75 ... 1.25 mm	0.3 mm

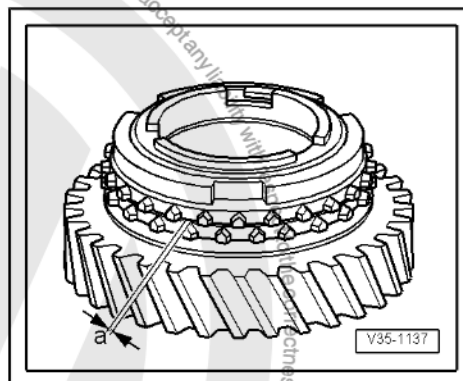




### Wear check of the synchronizer ring of 1st and 2nd gears

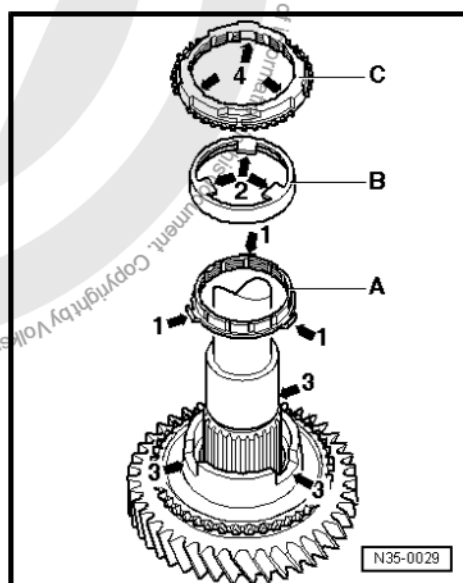
- Press the synchroniser ring, internal and external tracks against the gear cone and measure the distance -a- with a feeler gauge.

Distance -a-	New part	Wear limit
1st and 2nd gears	1,2 ... 1.8 mm	0.5 mm



### Installation position of the outside and inner rings of the 2nd gear synchronizer ring

- Install inner ring -A- on the 2nd gear wheel. The curve shoulders -arrow 1- shall face the outer ring -B-.
- Install the outer ring -B- over. The flanges -arrow 2- shall fit in the grooves -arrow 3- of the gear.
- Install the synchronizer ring -C- over. The grooves -arrow 4- shall fit in the relieves -arrow 1- on inner ring -A-.



### Disassembling and assembling the 1st and 2nd gear engaging sleeve and synchronizer

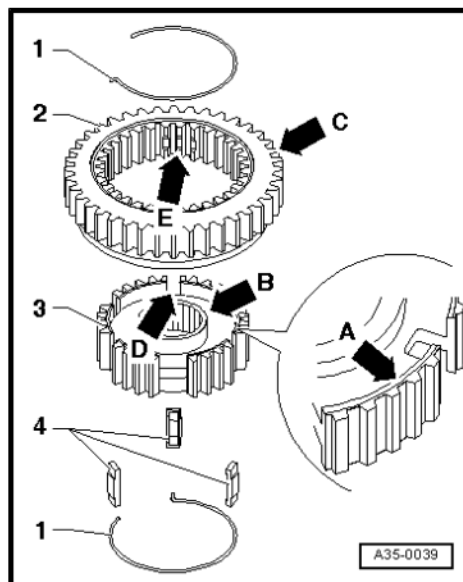
- 1 - Spring
- 2 - Engaging sleeve
- 3 - Synchronizer
- 4 - Retainer

- Press the engaging sleeve on the synchronizer.

The notch on front face -arrow A- and the wide collar -arrow B- shall face the external teeth on the engaging sleeve -arrow C- after installing.

The deeper grooves -arrow D- for the limiters located on the synchronizer shall match the notches -arrow E- on the engaging sleeve.

- Install the limiters in the deeper grooves -arrows-.







### Assembling 1st and 2nd engaging sleeve/synchronizer

- Press the engaging sleeve on the synchronizer
- Install the limiters in the deeper grooves -arrows-.
- Install springs -B- and -C- displaced by -a-



Note

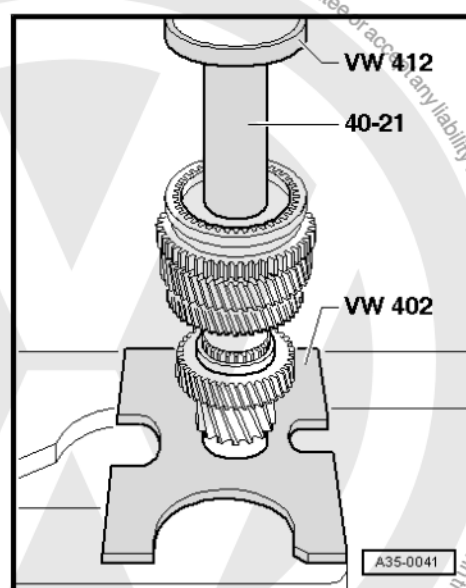
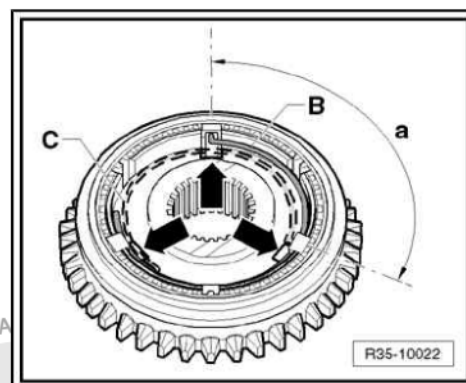
-a- = 120°

- The folded end of the spring shall fit into the limiter's hole.

### Installation of 1st and 2nd engaging sleeve/synchronizer

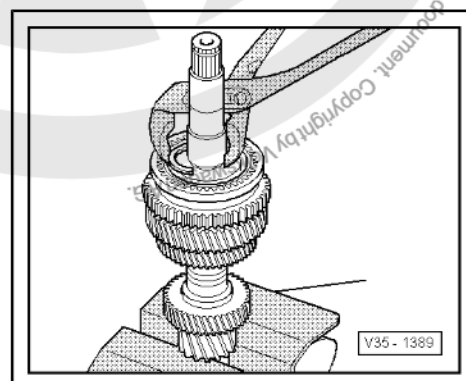
Installation position: The notch for the selector fork located on the lug sleeve must face the 1st gear and the teeth for the reverse gear towards the 2nd gear.

- Turn the synchronizer ring in order to match flanges and limiters.



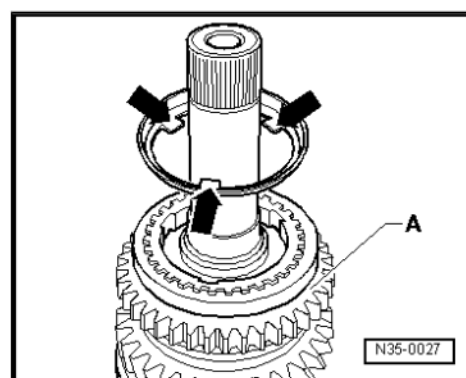
### Installing circlip

- Install the 1st gear circlip on the engaging sleeve/synchronizer.



### Installation position of the 1st gear outer ring

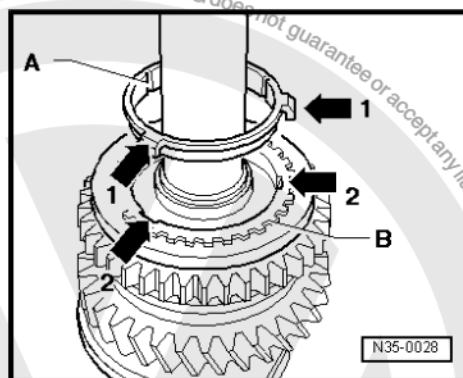
The flanges -arrows- shall face the teeth for reverse gear.





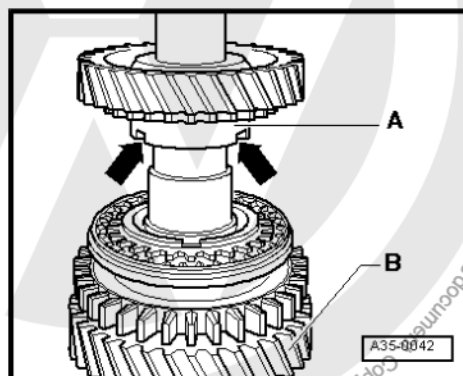
#### Installation position of the 1st gear inner ring -A-

The flanges -arrow 1- fit in the notches -arrow 2- on synchronizer ring -B-.



#### Installation position for 1st gear moving wheel

The tall collar -A- shall face the 2nd gear -B-. The collar notches -arrows- fit on the outer ring flanges -arrow-.





## 39 – Final drive - differential

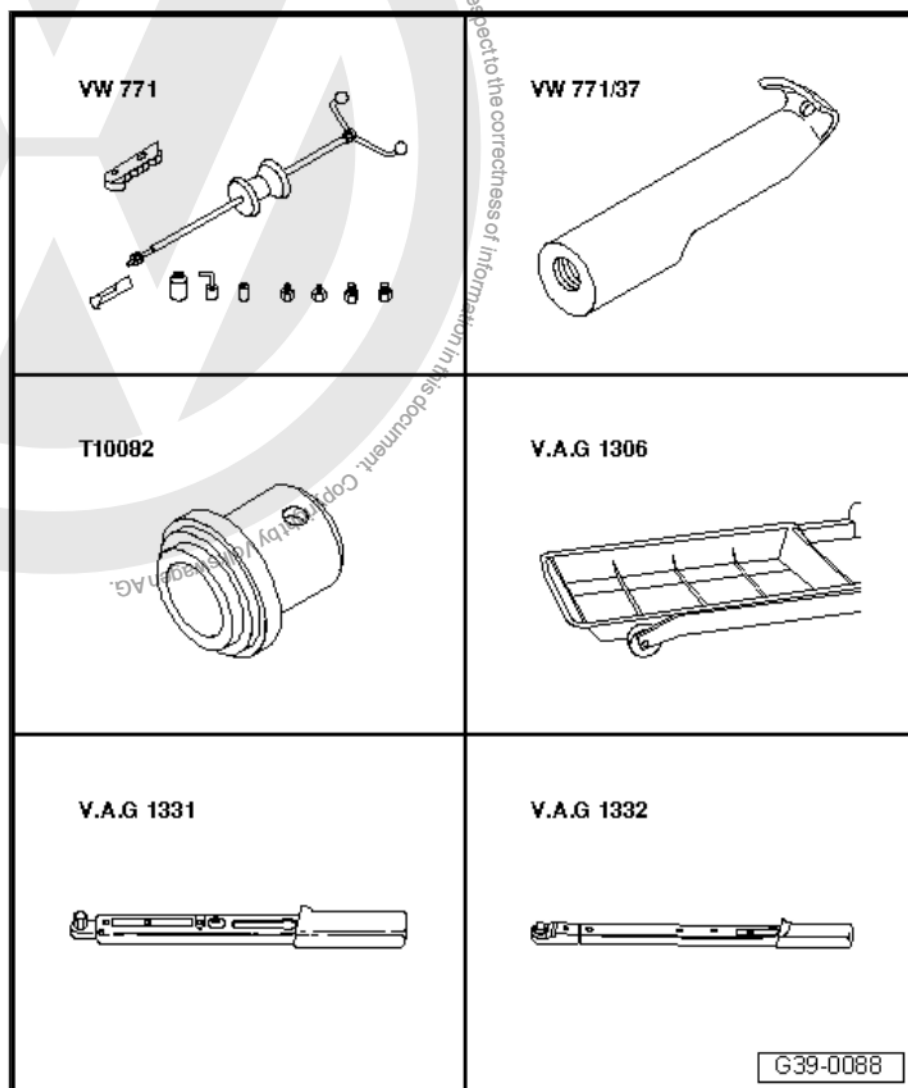
### 1 Drive flange

⇒ "1.1 Left drive flange retainer (left side) - replace", page 157

⇒ "1.2 Drive flange retainer (right side) - replace", page 160

#### 1.1 Left drive flange retainer (left side) - replace

Special tools and workshop equipment required



- ◆ Bush and roller bearing puller - VW 771-
- ◆ Complement - VW 771/37-
- ◆ Pressure base - T10082-
- ◆ Oil collecting tray - VAG 1306-
- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-
- ◆ Torque Wrench - 40 to 200 Nm ( 1/2" drive) - VAG 1332-



## 1.1.1 Removal



### Note

*With the gearbox installed.*

- Lift the vehicle.

For diesel engine vehicles:

- Remove the lower engine noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - Front section .

Continuation:

- Slightly loosen the screws that fasten the drive shaft with constant velocity joint (left side) to the transmission drive flange.
- Remove the left side wheel.
- Turn the steering wheel to the left stop.
- Remove the screws -2- that fasten the drive shaft with constant velocity joint (left side) -3- to the transmission drive flange.

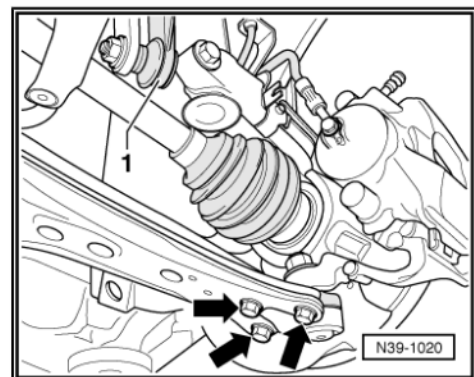
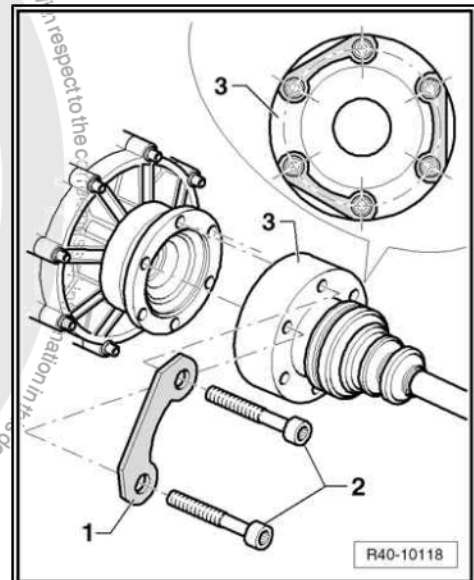
Mark the installation position of the screws that fasten the lower articulation of the suspension's left wishbone (transversal). Consult ⇒ Chassis, axles, steering; Rep. gr. 40 ; Front suspension .

Continuation for:

Fastening screws:

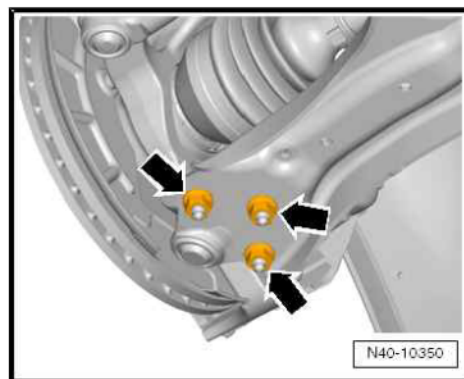
- Remove the securing bolts -arrows-. Consult ⇒ Chassis, axles, steering; Rep. gr. 40 ; Front suspension .

Fastening nuts:





- Remove the fastening nuts -arrows-. Consult ➤ Chassis, axes, steering; Rep. gr. 40 ; Front suspension .

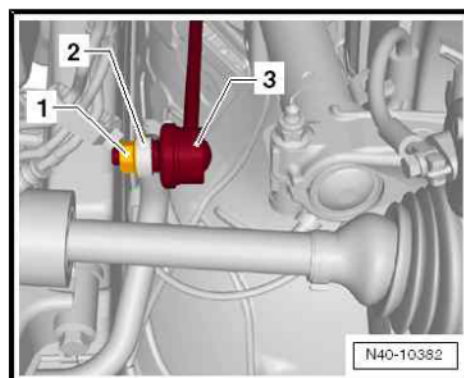


- Remove the hex nut -1- from coupling rod -3-.
- Remove the coupling rod -3- from the stabiliser -2-.
- Displace the suspension strut, pulling it away from the wishbone (transversal).
- Place the final drive with constant velocity joint (left side) upwards and fasten it with wire on the suspension strut.

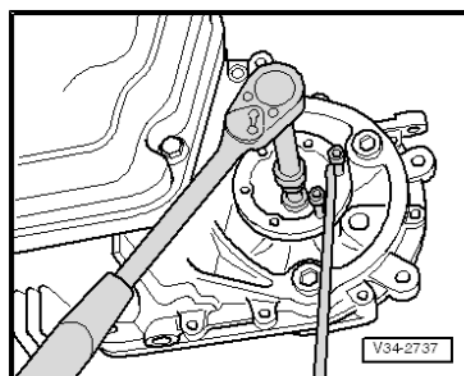


#### Note

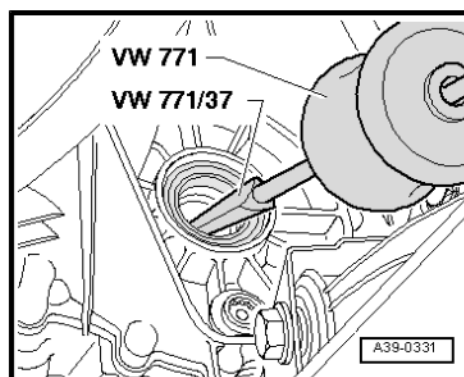
*The drive shafts with constant velocity joint must not be pressed downwards. Otherwise, the internal articulation will be damaged due to excessive tilting.*



- Remove the drive flange fastening screw by using two screws to lock the flange with a lever.
- Place the Oil collector - VAG 1306- under the gearbox.
- Remove the drive flange with the spring.



- Remove the drive flange retainer (left side) with the Bush and bearing puller - VW 771- and the Complement - VW 771/37- .





## 1.1.2 Installation



### WARNING

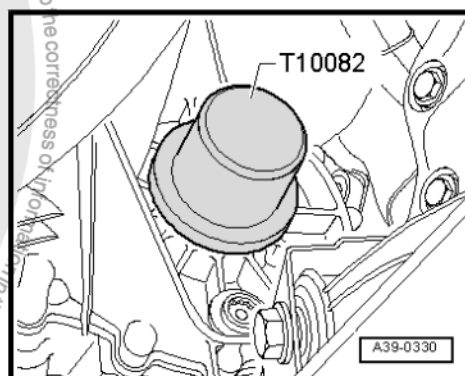
- ◆ When handling chemicals follow the safety instructions ⇒ *Chemical Products Manual; Rep. gr. 00*
- ◆ Assignment of Chemical Materials ⇒ *Electronic Parts Catalogue "ETKA"*

Installation is performed in reverse to removal sequence, considering the following:

- Install the new retainer to the stop without tilting it.
- Fill the half space between the sealing lip and the boot with Grease - G 052 128 A1- .
- Install the drive flange, fastening it with the countersunk bolt. Tightening torque, see ⇒ [Item 1 \(page 165\)](#) .
- Install the drive shaft with constant velocity joint (left side) onto the transmission drive flange. Refer to ⇒ Chassis, axles, steering; Rep. gr. 40 ; Front suspension .
- Check gear oil level and fill, if necessary ⇒ [page 104](#) .

For diesel engine vehicles:

- Install the lower engine noise insulation ⇒ General body repairs, exterior; Rep. gr. 50 ; Body - Front section .
- Install the left side wheel. Tightening torque, refer to ⇒ Chassis, axles, steering; Rep. gr. 44 ; Vehicle wheels, tyres, measurement .

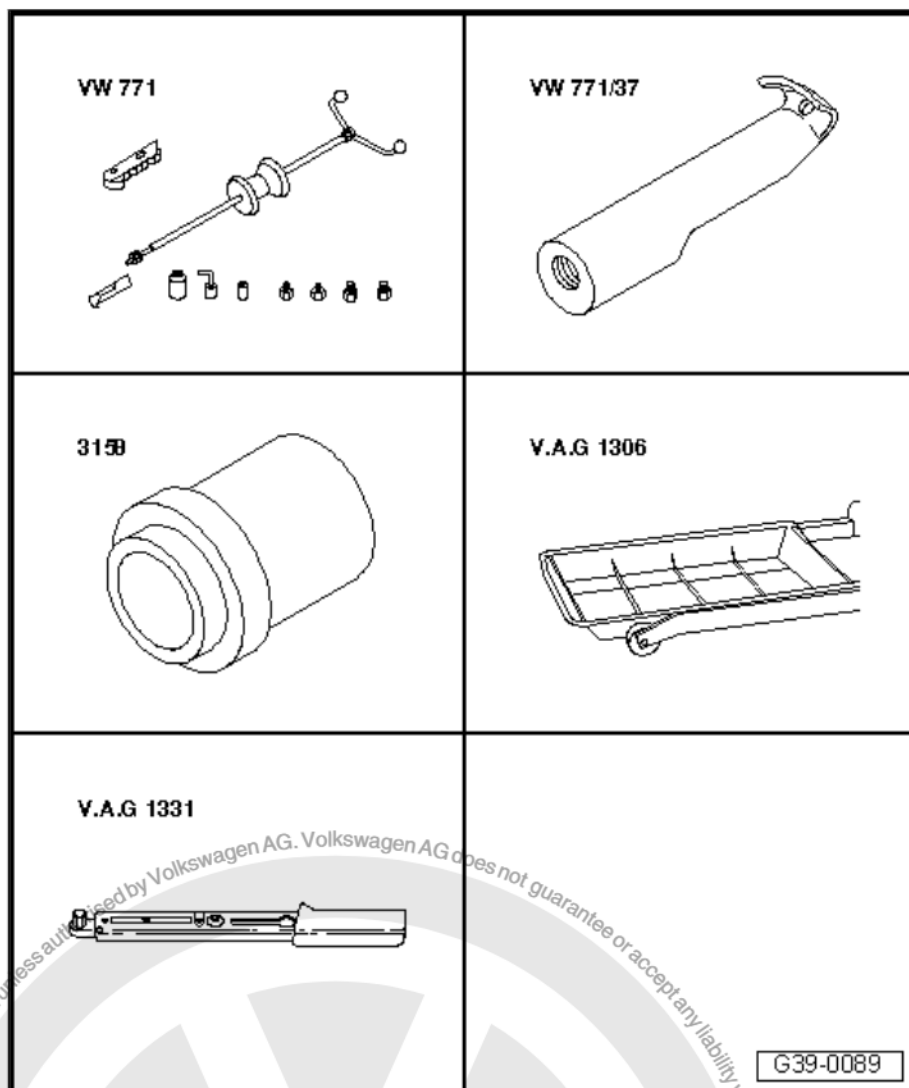


## 1.2 Drive flange retainer (right side) - replace





Special tools and workshop equipment required



- ◆ Bush and roller bearing puller - VW 771-
- ◆ Complement - VW 771/37-
- ◆ Fitting sleeve - 3158-
- ◆ Oil collecting tray - VAG 1306-
- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-

### 1.2.1 Removal



Note

*With the gearbox installed:*

- Lift the vehicle.

For diesel engine vehicles:

- Remove the lower engine noise insulation ➤ General body repairs, exterior; Rep. gr. 50 ; Body - Front section .

Continuation:

- Turn the steering wheel to the right stop.

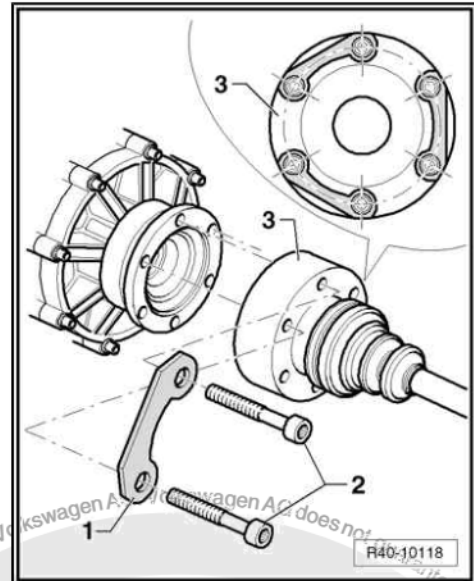


- Remove the screws -2- that fasten the drive shaft with constant velocity joint (right side) -3- to the gearbox drive flange.
- Place the final drive with constant velocity joint (right side) upwards and fasten it with wire on the suspension strut.

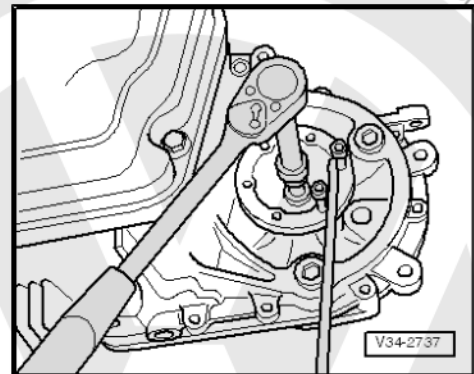


#### Note

*The drive shafts with constant velocity joint must not be pressed downwards. Otherwise, the internal articulation will be damaged due to excessive tilting.*



- Remove the drive flange fastening screw by using two screws to lock the flange with a lever.
- Place the Oil collector - VAG 1306- under the gearbox.
- Remove the drive flange with the spring.

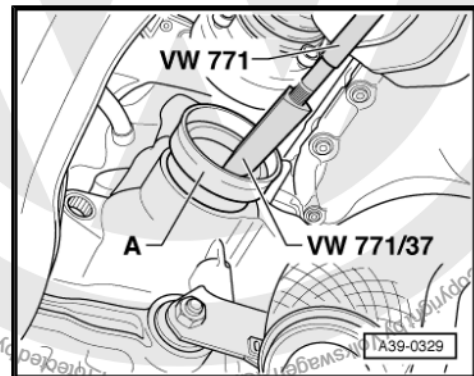


- Remove the drive flange retainer (right side) with the Bush and bearing puller - VW 771- and the Complement - VW 771/37- .



#### Note

- ◆ Do not damage retainers -A-; otherwise, leaks may occur.
- ◆ Replace the retainer, if damaged.



## 1.2.2 Installation



#### WARNING

- ◆ When handling chemicals follow the safety instructions ➔ Chemical Products Manual; Rep. gr. 00
- ◆ Assignment of Chemical Materials ➔ Electronic Parts Catalogue "ETKA"

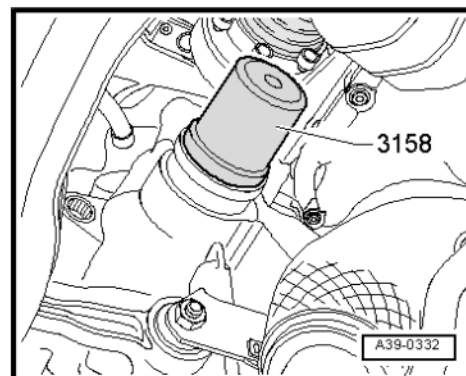
Installation is performed in reverse to removal sequence, considering the following:



- Install the new retainer to the stop without tilting it.
- Fill the half space between the sealing lip and the boot with Grease - G 052 128 A1- .
- Install the drive flange, fastening it with the countersunk bolt. Tightening torque, see ➔ [Item 1 \(page 165\)](#) .
- Install the drive shaft with constant velocity joint (right side) onto the transmission drive flange. Refer to ➔ Chassis, axles, steering; Rep. gr. 40 ; Front suspension .
- Check gear oil level and fill, if necessary ➔ [page 104](#) .

For diesel engine vehicles:

- Install the lower engine noise insulation ➔ General body repairs, exterior; Rep. gr. 50 ; Body - Front section .





## 2 Differential

⇒ ["2.1 Differential - general overview of assembly", page 164](#)

⇒ ["2.2 Differential - disassemble and assemble", page 167](#)

⇒ ["2.3 Differential - adjust", page 173](#)

### 2.1 Differential - general overview of assembly



#### WARNING

- ◆ *When handling chemicals follow the safety instructions ⇒ Chemical Products Manual; Rep. gr. 00*
- ◆ *Assignment of Chemical Materials ⇒ Electronic Parts Catalogue "ETKA"*



#### Note

- ◆ *Heat inner ring of the tapered roller bearing to 100 °C before installing.*
- ◆ *Always change both tapered roller bearings as a set.*
- ◆ *Adjust the differential when replacing the tapered roller bearings, differential case, transmission housing or clutch housing ⇒ [page 173](#).*





1 - Countersunk bolt

- ☐ 25 Nm
- ☐ Fasten on the threaded part  
⇒ [Item 8 \(page 165\)](#)

2 - Right drive flange

- ☐ Do not invert. The right and left drive flanges are different

3 - Pressure spring for drive flange

- ☐ Installed behind the drive flange

4 - Sealing washer

- ☐ Installation position: lip facing the pressure spring

5 - Tapered ring

- ☐ Installation position: shoulder facing the differential case

6 - Circlip

- ☐ keeps the tapered ring, sealing washer and spring in position when the propelling flange is removed

7 - Planetary gear

- ☐ Installation ⇒ [page 173](#)

8 - Flanged shaft nut

- ☐ Installation ⇒ [page 173](#)

9 - Differential pinion pin

- ☐ Removal ⇒ [page 172](#)
- ☐ Installation ⇒ [page 173](#)

10 - Planetary gear

- ☐ Installation ⇒ [page 173](#)

11 - Stop cover for planetary gears

- ☐ Install lubricated with gear oil

12 - Left drive flange

- ☐ With retainer plate
- ☐ Do not invert. The right and left drive flanges are different

13 - Retainer for the left drive flange

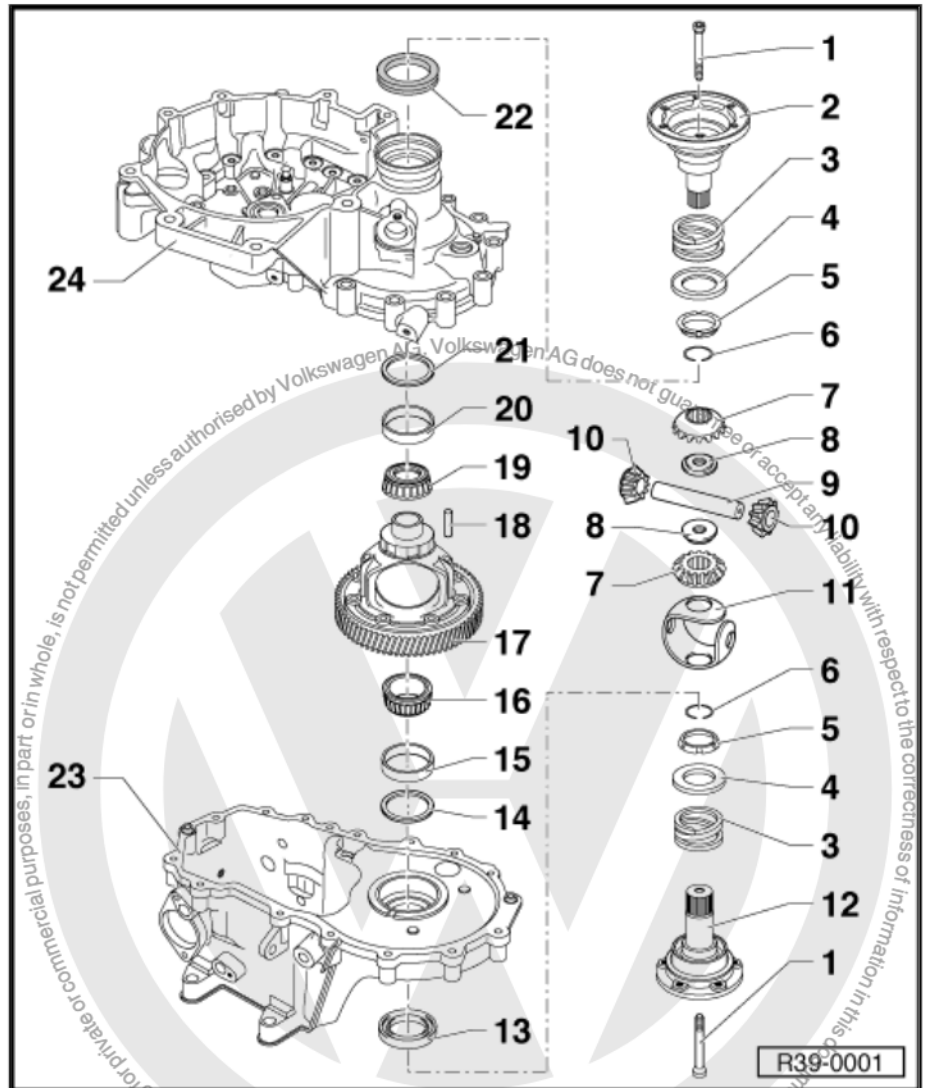
- ☐ Left and right diameters are different
- ☐ Replace ⇒ [page 157](#)

14 - Adjustment shim S<sub>1</sub>

- ☐ For the differential
- ☐ Always with 1-mm thickness
- ☐ Only used on gearbox housings -02T.301.103.L- and -02T.301.103.AA-

15 - Outer ring on the tapered roller bearing

- ☐ Removal ⇒ [page 170](#)
- ☐ Installation ⇒ [page 171](#)





16 - Tapered roller bearing

- ☐ Removal ⇒ [page 172](#)
- ☐ Installation ⇒ [page 172](#)

17 - Differential case

- ☐ With riveted crown wheel
- ☐ If replacement is necessary, the planet pinion should also be replaced ⇒ [Item 3 \(page 149\)](#)

18 - Elastic pin

- ☐ To fasten the differential pinion pin

19 - Tapered roller bearing

- ☐ Removal ⇒ [page 171](#)
- ☐ Installation ⇒ [page 172](#)

20 - Outer ring on the tapered roller bearing

- ☐ Removal ⇒ [page 171](#)
- ☐ Installation ⇒ [page 171](#)

21 - Adjustment shim S<sub>2</sub>

- ☐ For the differential
- ☐ Determine thickness ⇒ [page 173](#)

22 - Retainer for the right drive flange

- ☐ Left and right diameters are different
- ☐ Replace ⇒ [page 157](#)

23 - Gearbox housing

- ☐ Assignment ⇒ Electronic Parts Catalogue "ETKA"
- ☐ Repair ⇒ [page 121](#)
- ☐ Apply Sealing compound - AMV 188 200 03- evenly over the sealing surface of the gearbox housing.
- ☐ In case of replacement, always adjust differential ⇒ [page 173](#)

24 - Clutch housing

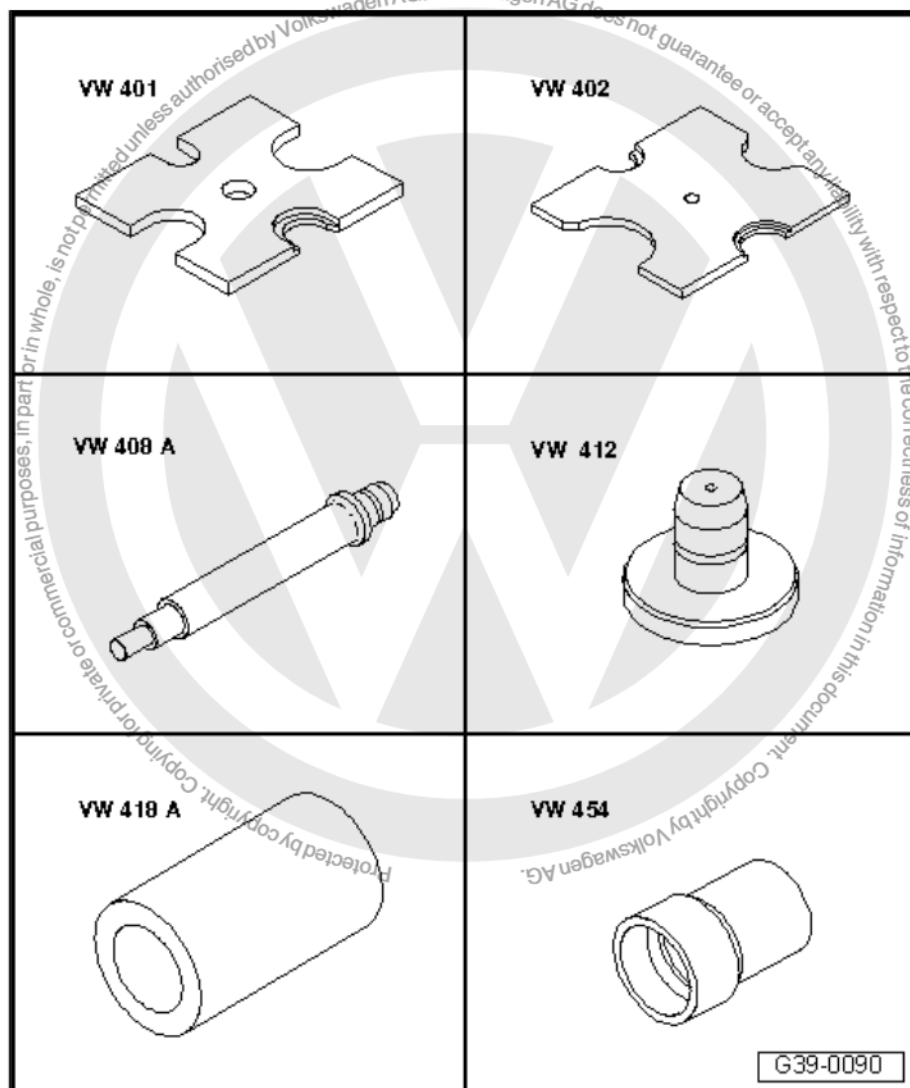
- ☐ Assignment ⇒ Electronic Parts Catalogue "ETKA"
- ☐ Repair ⇒ [page 121](#)
- ☐ Apply Sealing compound - AMV 188 200 03- evenly over the sealing surface of the gearbox housing.
- ☐ In case of replacement, always adjust differential ⇒ [page 173](#)



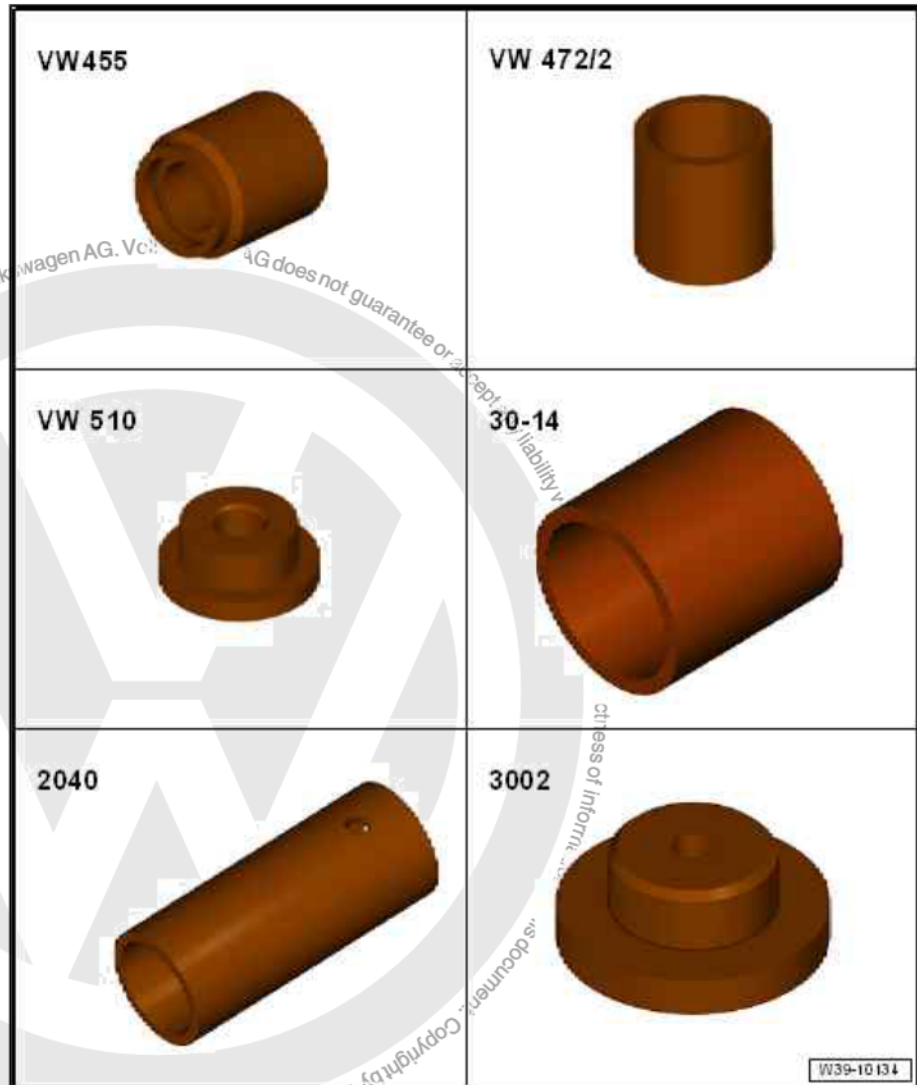


## 2.2 Differential - disassemble and assemble

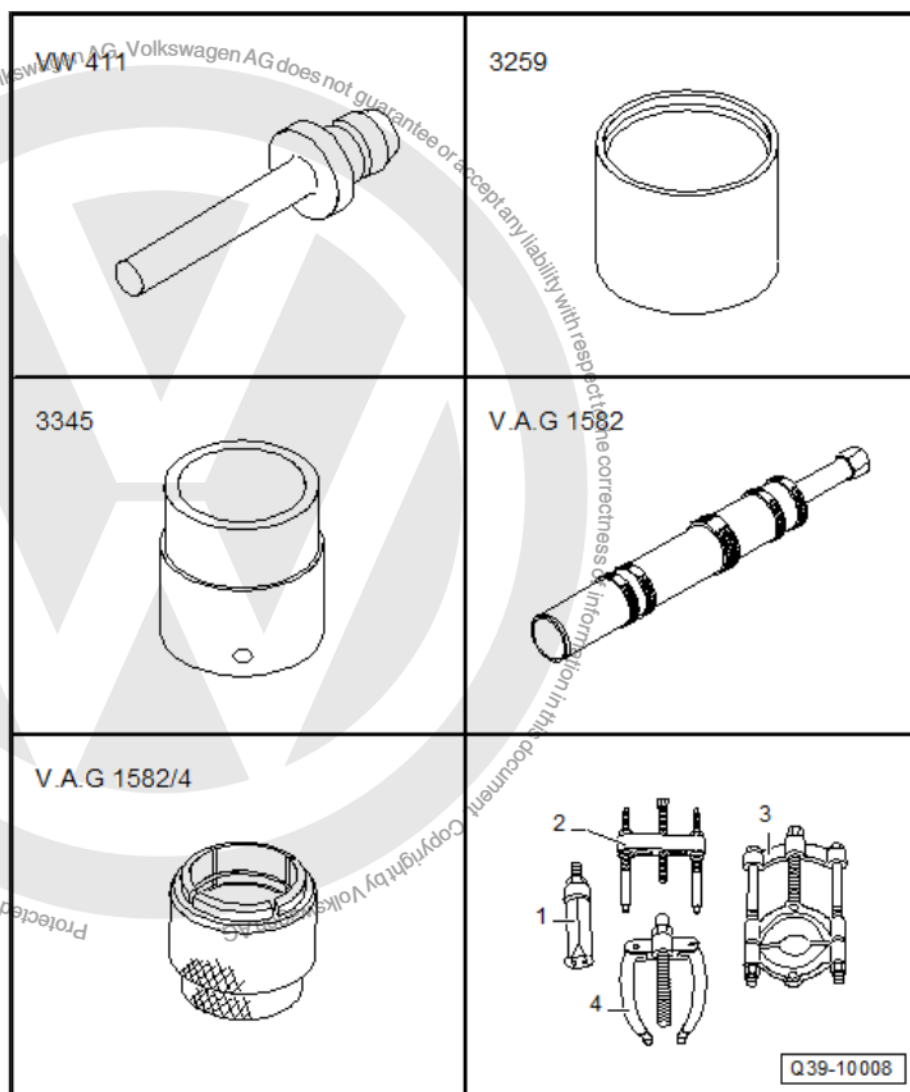
Special tools and workshop equipment required



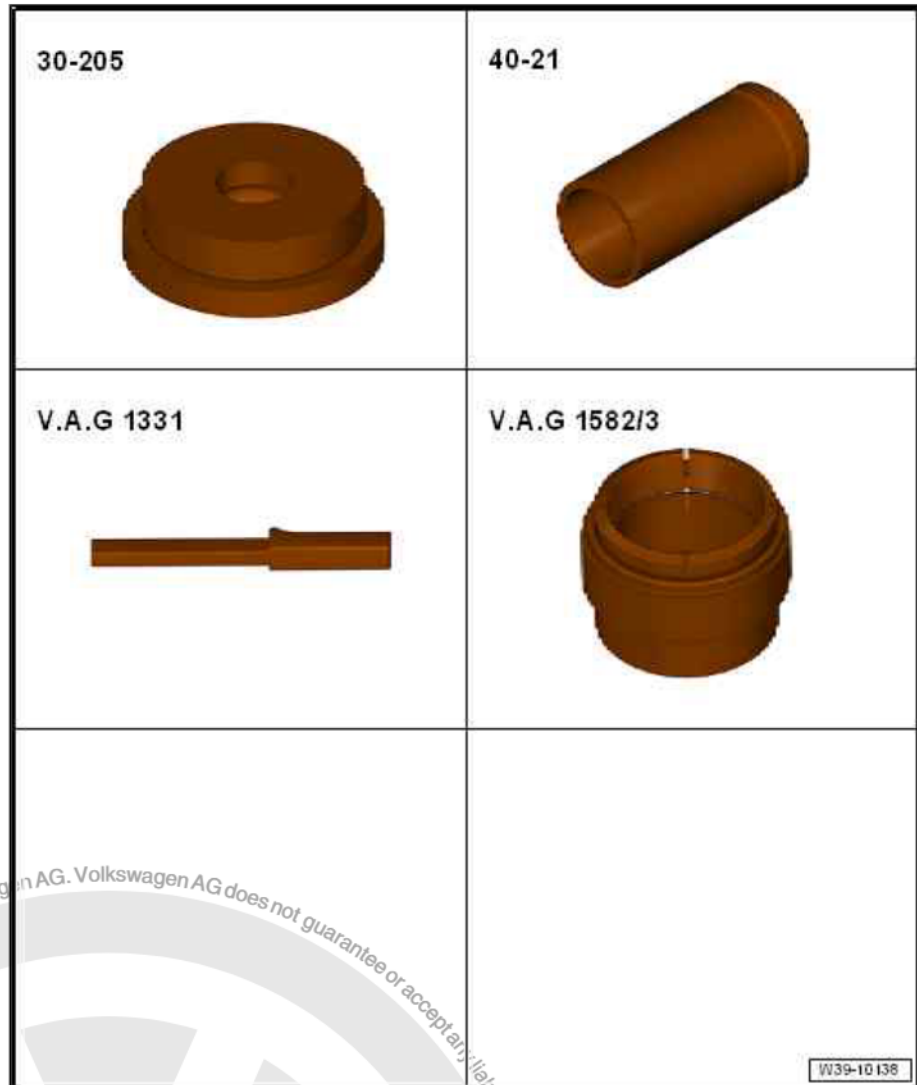
- ◆ Plate - VW 401-
- ◆ Plate - VW 402-
- ◆ Pressure pin - VW 408 A-
- ◆ Pressure disc - VW 412-
- ◆ Pressure tube - VW 418 A-
- ◆ Pressure tube - VW 454-



- ◆ Fitting tool - VW 455-
- ◆ Sleeve - VW 472/2-
- ◆ Pressure base - VW 510-
- ◆ Extractor tube - 30-14-
- ◆ Tube - 2040-
- ◆ Pressure base or 3002 - VW 3002-



- ◆ Pressure pin - VW 411-
- ◆ Tube - 3259-
- ◆ Fitting tool - 3345-
- ◆ Bearing puller - VAG 1582-
- ◆ Calliper - VAG 1582/4-
- ◆ -1- 46 - 56 mm Puller or VW 020T - Kukko 21/7-
- ◆ -4- Auxiliary support - KUKKO 22/2-



- ◆ Pressure base or VW 062 - 30-205-
- ◆ Support tube - 40-21-
- ◆ Torque wrench - 5 to 50 Nm ( 1/2" drive) - VAG 1331-
- ◆ Calliper - VAG 1582/3-

Removing the outer ring on the tapered roller bearing of the gearbox housing

A - Auxiliary support - KUKKO 22/2-

B - 46 - 56mm Puller or VW 020T - Kukko 21/7-



#### Note

After removing the outer bearing race, check for the presence of adjustment shim  $S_1$ . This adjustment shim  $S_1$  is only used on a few housings of the gearbox ➔ [Item 14 \(page 124\)](#).

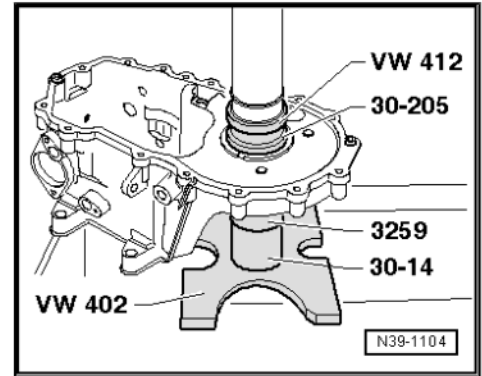


Installing the outer bearing race of the tapered roller bearing on the gearbox housing



Note

- ◆ Install adjustment shim  $S_1$  (standard 1 mm) below the outer bearing race in case it has been disassembled.
- ◆ This adjustment shim  $S_1$  is only used on a few housings of the gearbox ⇒ [Item 14 \(page 124\)](#).
- Support the gearbox housing by placing the Tube - 3259- directly below the bearing support.



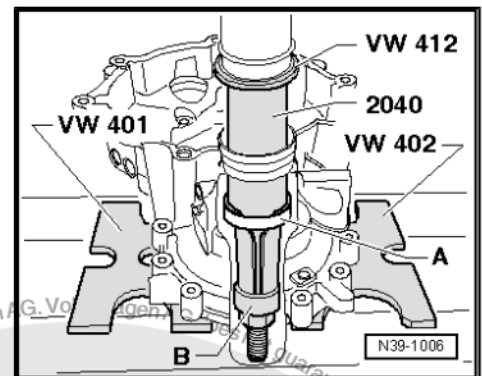
Removing the outer race from the tapered roller bearing -A- of the clutch housing

- Use Puller 46 - 56mm or VW 020T - Kukko 21/7- -B- to remove the outer race from the tapered roller bearing.



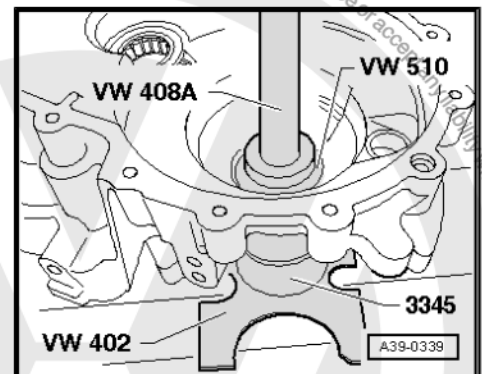
Note

Remove the Speed sensor - G22- before removing the outer race from the tapered roller bearing.



Installing the outer race on the tapered roller bearing of the clutch housing

- Support the clutch housing by placing the Fitter - 3345- directly below the bearing support.
- Install the Speed sensor - G22- after installing the outer bearing race.



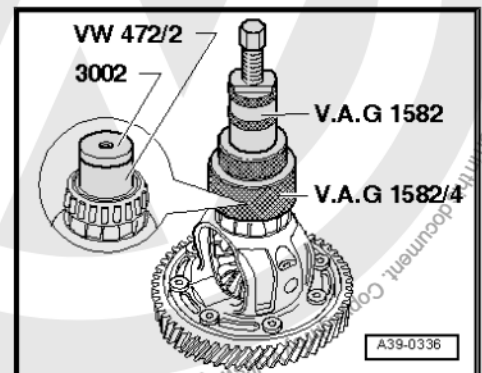
Removing the inner ring from the tapered roller bearings

- Before installing the puller, install Sleeve - VW 472/2- - VW 472/2- and the Pressure base or VW 3002 - 3002- on top the differential case.



Note

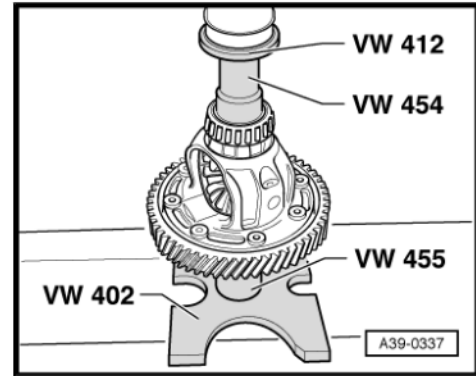
The internal tracks on both roller bearings are removed in an identical way as for the differential case.





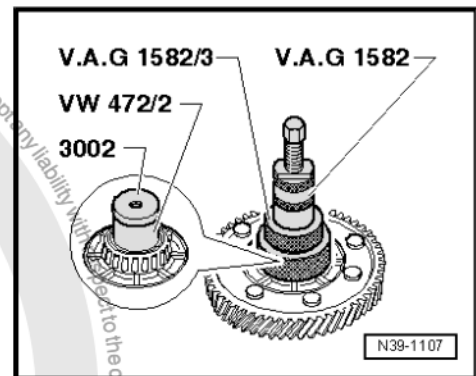
#### Installing the inner ring on the tapered roller bearings

- Support the internal track on the opposite side with the pressing bushing -VW 455- .



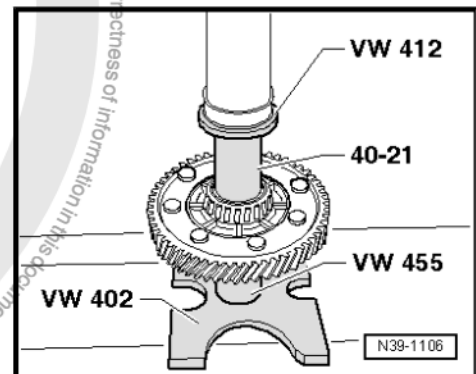
#### Removing the inner ring from the tapered roller bearing

- Before mounting the pulling device, place the Sleeve - VW 472/2- and the Pressure base or VW 3002 - 3002- in the planetary gear box.



#### Installing the inner ring on the tapered roller bearing

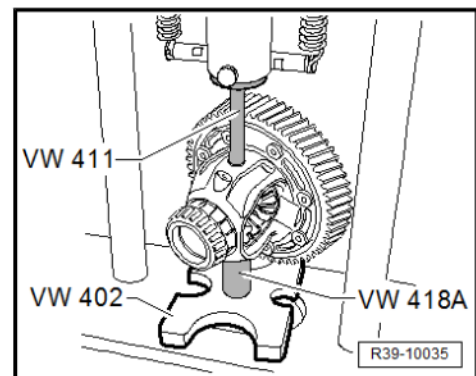
- Support the inner ring on the opposite side with the Fitter - VW 455- .



#### Removing the differential pinion pin

Press the elastic pin until it shears, to remove the shaft.

- Remove the elastic pin remains from the differential case.

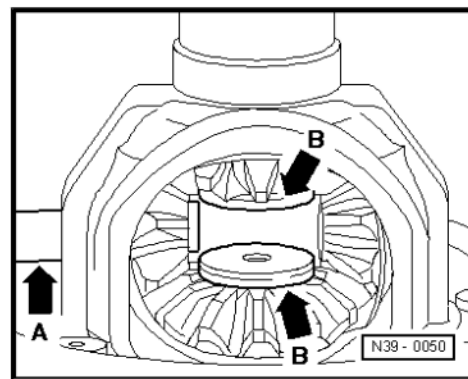






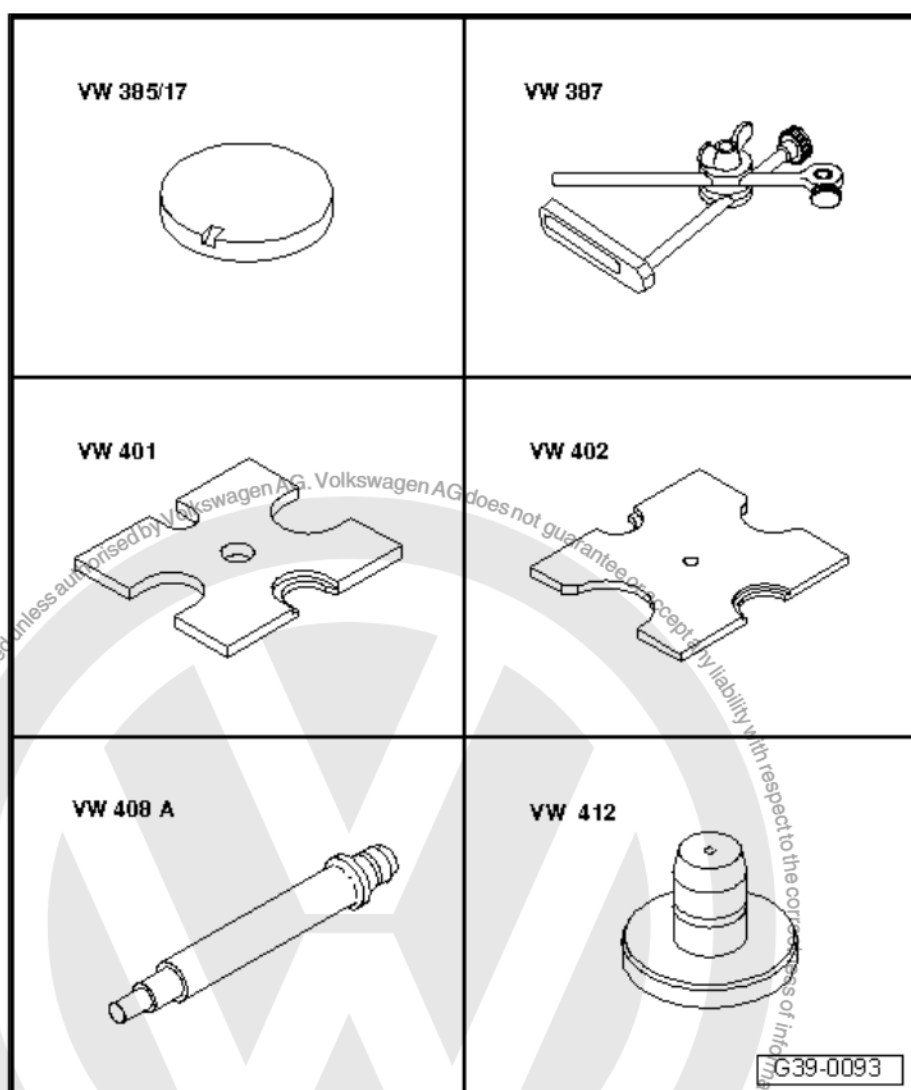
### Installing the planetary and planetary gears

- Lubricate the stop cover of the planetary gears with gear oil.
- Install the two planetary gears and lock them (for example, with the drive flange).
- Install the satellite gears displaced by 180°
- Install the differential pinion pin -arrow A- to the first planetary gear.
- Install nuts -arrows B- on the planetary gears. Installation position: edge facing the planetary gear.
- Install the differential pinion pin to the stop and fasten it with the elastic pin.



## 2.3 Differential - adjust

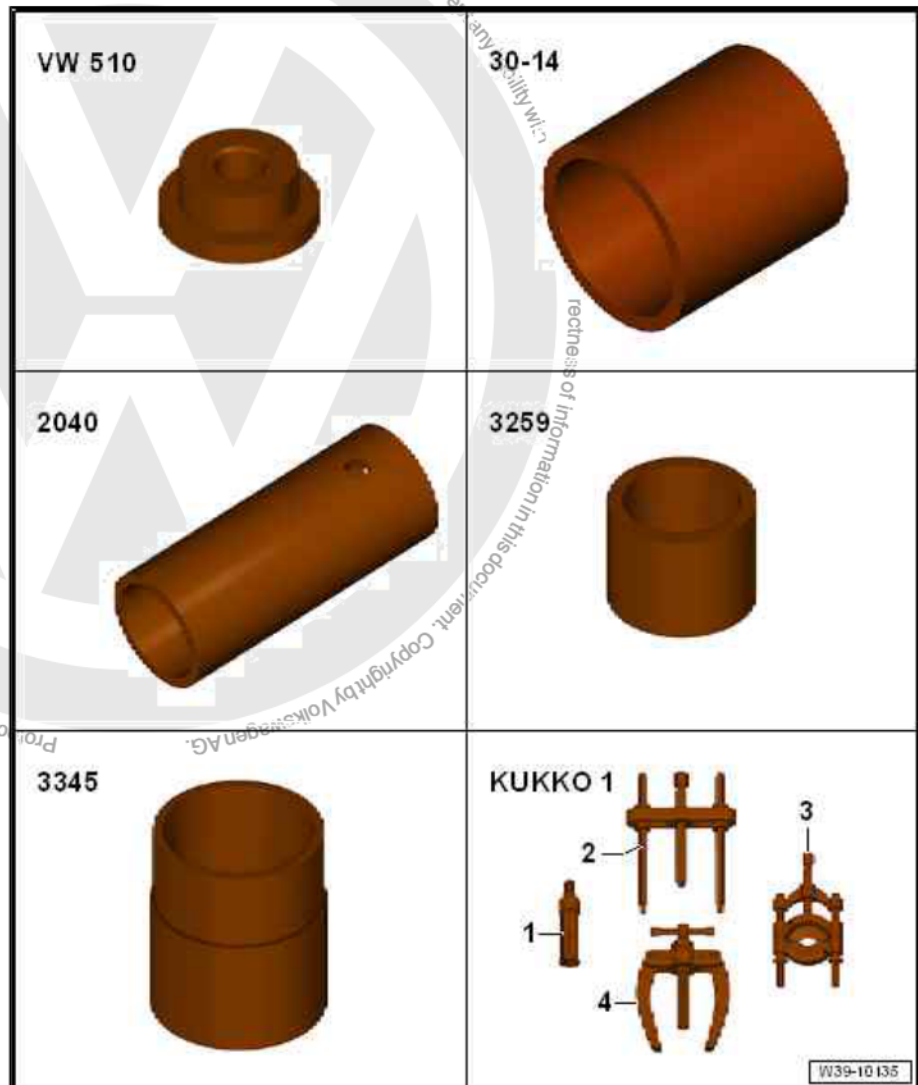
Special tools and workshop equipment required



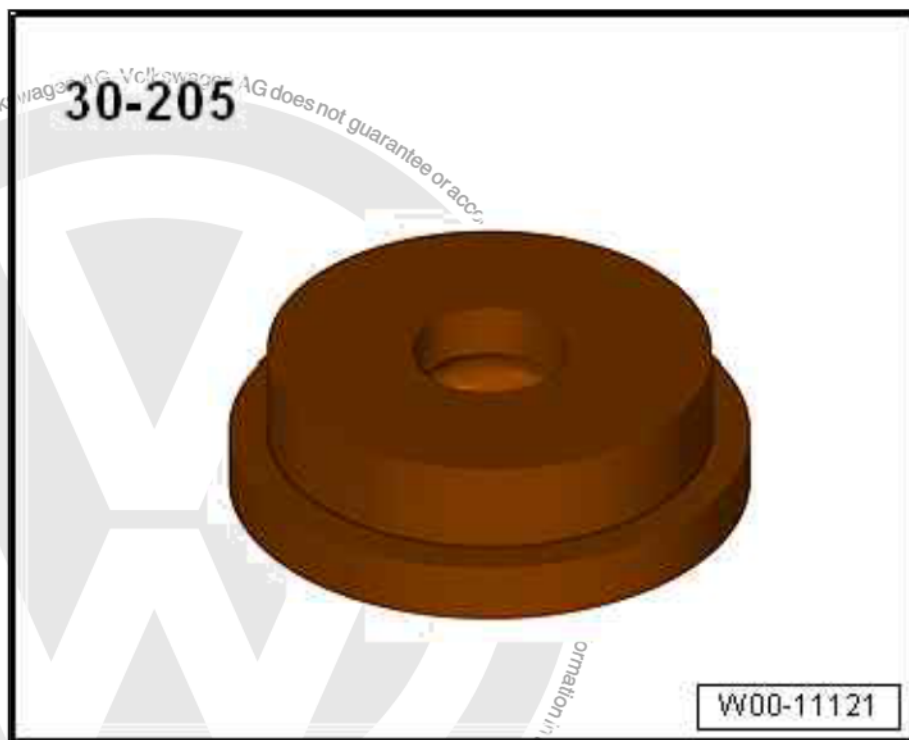
- ◆ Measuring disc or VW 385 - VW 385/17-
- ◆ Mounting bracket - VW 387-
- ◆ Plate - VW 401-
- ◆ Plate - VW 402-



- ◆ Pressure pin - VW 408A-
- ◆ Pressure disc - VW 412-



- ◆ Pressure base - VW 510-
- ◆ Extractor tube - 30-14-
- ◆ Tube - 2040-
- ◆ Tube - 3259-
- ◆ Fitting tool - 3345-
- ◆ -1- 46 - 56 mm Puller or VW 020T - Kukko 21/7-



◆ Pressure base - 30-205-

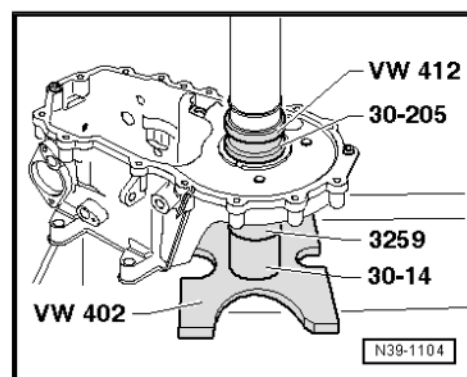
The differential shall be adjusted when replacing the following components:

- ◆ Gearbox housing
- ◆ Clutch housing
- ◆ Differential case
- ◆ Tapered roller bearings of the differential
- Installing the outer bearing race (pinion side) on the gearbox housing ⇒ [page 171](#)



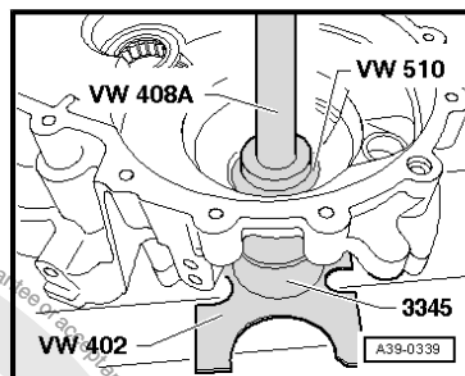
Note

*The inside and outside tracks of the tapered roller bearings form an assembly (pairs) and should not be inverted.*





- Install the outer bearing race (opposite side of pinion) on the clutch housing without adjustment shim.
- Install the differential on the clutch housing.
- Install the gearbox housing and tighten the 5 screws to the corresponding tightening torque ➔ [Item 3 \(page 110\)](#)



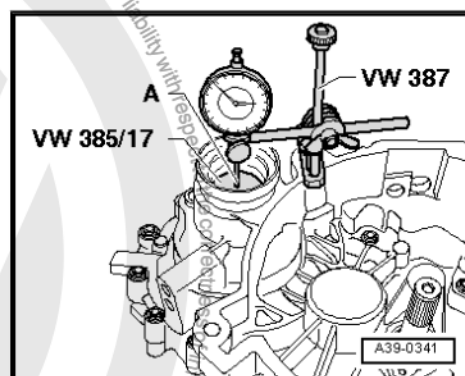
- Install the measuring device and the dial gauge by using an extender -A- of approx. 30 mm.
- Reset the dial gauge to zero with 1-mm pre-tension.
- Move the differential upwards and downwards, read the clearance on the dial gauge and write down (in the example: 1.50 mm).

#### Determine adjustment shim thickness $S_2$

The pre-tension required for the roller bearing is achieved by adding a constant pressure value (0.35 mm) to the value achieved during the measurement for  $S_2$ .

Example:

Measured value	1.50 mm
+ pressure (constant value)	0.35 mm
Adjustment shim $S_2$ thickness =	1.85 mm

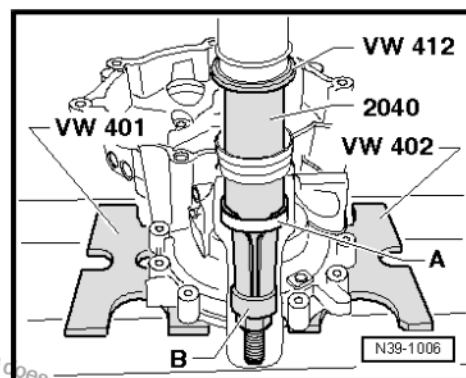




- Remove the clutch housing and the outer bearing race -A-.
- B - 46 - 56 mm Puller or VW 020T - Kukko 21/7-
- Install adjustment shim S2 with the corresponding thickness (in the example, 1.85 mm) and reinstall the outer bearing race in the clutch housing ⇒ [page 171](#)

Adjustment shims:

Thickness (mm)	Replacement parts No.
0.65	-02K 409 210-
0.70	-02K 409 210 A-
0.75	-02K 409 210 B-
0.80	-02K 409 210 C-
0.85	-02K 409 210 D-
0.90	-02K 409 210 E-
0.95	-02K 409 210 F-
1.00	-02K 409 210 G-
1.05	-02K 409 210 H-
1.10	-02K 409 210 J-
1.15	-02K 409 210 K-
1.20	-02K 409 210 L-
1.25	-02K 409 210 M-
1.30	-02K 409 210 N-
1.35	-02K 409 210 P-
1.40	-02K 409 210 Q-



The existence of different tolerances enables calibrating the required shim thickness with accuracy.

If the required thickness for the adjustment shim is greater than that indicated on the table, install 2 shims which thickness sum is equivalent.

- Install the transmission housing and tighten bolts to the corresponding tightening torque ⇒ [Item 3 \(page 110\)](#) .